Public Works Department
Bombay Presidency

Irrigation Administration Report

Bombay Presidency

Part I

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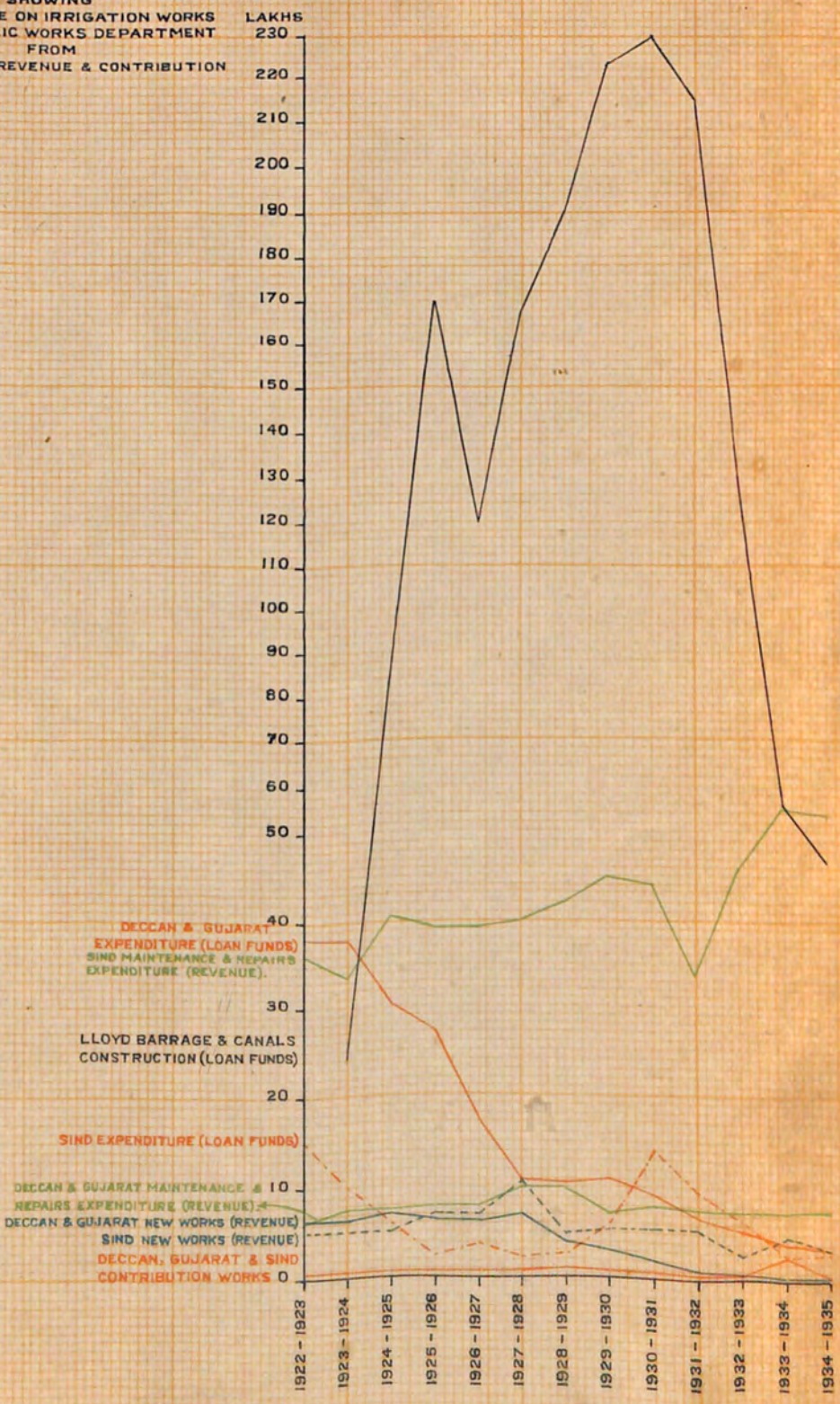
DIAGRAM

SHOWING

EXPENDITURE ON IRRIGATION WORKS IN THE PUBLIC WORKS DEPARTMENT FROM LOAN FUNDS, REVENUE & CONTRIBUTION



G. P. S. O, POONA, 1936.

MAP OF DECCAN & GUJARAT

TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT.

1931-32

SCALE 40 MILES TO 1 INCH

REFERENCES

NORTHERN CIRCLE

Ahmedabad Division.
Kaira and Panchmahals Division.
Surat and Broach Division.

CENTRAL CIRCLE

Satara Division.
Sholapur Division.
Khandesh Division.

DECCAN IRRIGATION CIRCLE

Nasik Irrigation Division.
Ahmednagar Division.
Mutha Canals Division.
Malshiras Division.

IRRIGATION DEVT. & RESEARCH CIRCLE

Nira L. B. Canal Division

SOUTHERN CIRCLE

Belgaum Division.
Dharwar Division.
Kanara Division.
Ratnagiri Division.

NORTHERN CIRCLE

AHMEDABAD DIVISION.

Works in Operation.

1. Hathmati Canal
2. Sabli Reservoir
3. Feeder Dadhwav Drainage
4. Vasnigam Drainage
5. Vatrak Drainage
6. Ghoda Feeder
7. Ogan Drain
8. Godhavi (Kosa) Drain
9. Chekala Drain
10. Khari Cut
11. Chandola Tank
12. Vasna Reservoir
13. Vatva Tank
14. Bhayla Feeder
15. Kankria & Wastrea Drainage of Dholka
16. Odhav-Sabarmati Drain
17. Halimpur Drain

KAIRA DISTRICT

Works in Operation.

18. Khari Shamla
19. Gobhaj Tank
20. Gadu Tank
21. Shavai Reservoir
22. Nadia Reservoir

KAIRA & PANCH MAHALS DIVISION

(i) KAIRA

Works in Operation.

1. Mesar Drain
2. Timer Tank
3. Nagrana Tank
4. Kathlal Tal Drain
5. Kankanpur Drain
6. Saint Tank
7. Sunel Tank
8. Wangroli Tank
9. Pandsar Tank
10. Mataval Tank
11. Tampas Gorad Drain

Incomplete Work.

12. Pachaj Tank

(ii) PANCH MAHALS

12. Mandalan Tank
13. Ranapalam Tank
14. Kadana Tank
15. Gorkala Tank
16. Malav Tank
17. Patalav Tank
18. Dangarla Tank
19. Bavlia Tank
20. Chhotabhava Amli Tank
21. Parsa Tank
22. Wavad Sagot Tank
24. Kundan Tank
25. Gorad Tank
26. Ghoghali Tank
27. Kanjeeta Wankhdi Tank
28. Wada Talav Tank
29. Juhi River Project

SURAT & BROACH DIVISION

(i) BROACH

Works in Operation.

1. Kosa-Mahuber Jetties Drainage Channel
2. Nahuvera Jetties Drainage Channel
3. Nandhara-Nahar Drainage Channel
4. Amanpur-Nadi Drainage Channel
5. Grahan Drainage Channel
6. Wavrada do. do.
7. Channel from Ghar Wila to mer Channel near Dabu
8. Kotana-Sela Drainage Chel
9. Ghamrad Drainage Chel. to
10. Wagra Channel and Branches
11. Wagra Channel
12. Jawaharpur Pandoha Channel
13. Pakhajan-Amalpur Channel
14. Nadiad-Akland Channel
15. Jalna Channel
15. Dra-Vitland-Sadrapur Channel
16. Rahad Channel
17. Waghaura Drainage Channel
18. Wasta Channel
19. Adas Nadi Channel
20. Anta Channel
21. Kathana Reformation Bund
22. Harapur do.
23. Protection Bund at Nadeeka
24. do. do. at Lachhgam
25. do. do. at Mathanger
26. do. do. at Gandhar
27. Bund at Wada Village
28. do. at Kanjeeta
29. Protection Bund at Vanda and Dewla Vinagam
30. do. at Dahej
31. do. at Kadeer
32. do. at Sava

(ii) SURAT

Works in Operation

33. Mutthan Channel
34. Waghai Protective Works
35. Bund between Kapsari and Kadhoot Villages

CENTRAL CIRCLE

SATARA DIVISION.

Works in Operation.

1. Krishna Canal
2. Nayni Tank
3. Upper Man River Works
4. Yerla River Works
5. Nimb Tank
6. Chikhli Canal
7. Ambavade Tank
8. Pimpli Tank
9. Rower Canal

Incomplete Works

7. Shengaon Tank

SHOLAPUR DIVISION

Works in Operation.

1. Ekruk Tank
2. Ashti do.
3. Pedav do.
4. Wadshivne Tank
5. Korngaon do.

Incomplete Work.

6. Hangi Tank
7. Mangi Tank

KHANDESH DIVISION.

Works in Operation.

1. Mukti Tank
2. Hiwra Tank
3. Tapi River Water Tributaries
4. Girna Panjhra River Group
5. Girna Panjhra River Group
6. Bori River Group
7. Kan River Group
8. Jamda B. B. Canal
9. Jamda B. B. Canal do.
10. Bhamer Tank
11. Harsola do.

Incomplete Work.

12. Pimpalgoda Tank

DECCAN IRRIGATION CIRCLE

NASIK IRRIGATION DIVISION.

Works in Operation.

1. Waghad Tank
2. Girnadevan Tank
3. Khirdisambe Tank
4. Dev. L. B. Canal
5. Waldevi do.
6. Palsi do.
7. Odha Tunnel Canal.
8. Palsi Tank
9. Ozar Group
10. Aram Group
11. Mosam Group
12. Godavari Canal
13. Kashwa do.
14. Darna do.
15. Dev do.
16. Mahadevgi Group
17. Nira Reservoir (Lake Bhatgi)
18. Godavari B. B. Canal
19. do. L. B. do.

Works under Construction—Incomplete Work.

20. Odsi Tank

AHMEDNAGAR DIVISION

Works in Operation.

1. Wilson Dam (Lake A. 902)
2. Chincholi Canal
3. do. L. B. Canal
4. Lake Canal
5. Shirsuli Tank
6. Khandgaon Tank
7. Pimpalgaon Tank

Works under Construction.

8. Vitapur Tank

MUTHA CANALS DIVISION.

Works in Operation.

1. Inlet Pits
2. Mutha R. B. Canal
3. Mutha L. B. do.
4. Mutha Tank

Incomplete Work.

5. Khadakwasla Tank
6. Warasgaon Tank
7. Khadakwasla Tank

Works under Construction and in Operation

8. Lloyd Dam on Mulagar River (Lake Warasgaon)
11. Mutha R. B. Canal (from mile 13 to 45)

MALSHIRAS DIVISION.

Works under Construction and partly in Operation

1. Nira R. B. Canal (from mile 45 to 106)

Incomplete Work.

2. Wiravgad Tank
3. Nimgaon Tank
4. Shendurni Tank
5. Bhandardara Tank

IRRIGATION DEVT. AND RESEARCH CIRCLE

NIRA LEFT BANK CANAL DIVISION

Works in Operation.

1. Nira L. B. Canal
2. Shirsuli Tank

SOUTHERN CIRCLE

BELGAUM DIVISION

Works in Operation.

1. Gokak Canal—its Barrage and Storage Works
2. Ghataprabha Tank

DHARWAR DIVISION.

Works in Operation.

1. Dandeli Tank
2. Hirehalli do.
3. Wadaj do.
4. Ajandi Tank
5. Dharwar and Navagal Canals
6. Marchhenahi Tank

KANARA DIVISION

Work in Operation.

1. Mandalgi Tank

Statement showing expenditure on establishment in the Roads and Buildings and the Irrigation Branches of the P. W. D. from the year 1921-22 to 1934-35 and the percentage on the total outlay on works and repairs during that period in both the Branches.

Year.	Expenditure on Establishment in the Roads and Buildings Branch.							Expenditure on Establishment in the Irrigation Branch.
	41—Civil Works—Provincial (Transferred and Reserved).	60—Civil Works.	41—Civil Works—Central.	50—Military Works.	Deposit Works.	Total.	Percentage on the total outlay on works and repairs in the Roads and Buildings Branch.	55—Construction of Irrigation, Navigation, Embankment and Drainage Works.
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs	Rs.		Rs.
1921-22 ..	29,06,955	..	1,98,683	45,258	2,84,992	34,35,888	19·26	11,53,734
1922-23 ..	20,14,640	8,34,450	1,78,163	71,481	77,143	31,75,877	20·79	14,20,751
1923-24 ..	15,84,488	8,10,645	67,892	38,560	6,88,354	31,89,939	19·88	21,87,793
1924-25 ..	16,89,892	12,25,632	1,19,721	27,862	2,52,556	33,15,663	19·67	29,10,785
1925-26 ..	18,89,417	12,05,078	1,01,876	69,049	2,58,535	35,23,955	20·66	32,21,647
1926-27 ..	25,30,286	5,97,486	1,68,896	5,882	3,94,389	36,96,939	23·76	35,56,959
1927-28 ..	21,99,448	5,59,107	1,49,132	5,042	2,97,270	32,09,999	24·96	36,98,956
1928-29 ..	22,40,393	6,56,713	2,29,540	2,240	2,56,180	33,85,066	25·03	39,04,670
1929-30 ..	22,45,450	7,33,867	1,56,773	3,638	2,34,897	33,74,625	25·26	42,26,873
1930-31 ..	25,51,711	1,80,139	1,72,163	2,415	85,444	29,91,872	32·35	42,88,966
1931-32 ..	25,93,104	2,32,929	1,22,799	3,182	44,132	29,96,146	38·70	40,37,972
1932-33 ..	23,74,603	71,981	85,143	3,334	17,156	25,52,217	39·79	28,70,427
1933-34 ..	22,73,945	31,807	71,866	3,810	30,502	24,11,930	37·97	17,60,690
1934-35 ..	21,88,729	38,278	62,472	2,693	47,694	23,39,866	35·82	15,36,830

Year.	Expenditure on Establishment in the Irrigation Branch—*contd.*					Total Establishment charges in the Roads and Buildings and Irrigation Branches.	Percentage on the total outlay of works and repairs in Roads and Buildings and Irrigation Branches.
	XIII—Works for which capital accounts are kept.	15—Other Revenue Expenditure financed from Ordinary Revenues.	Deposit Works.	Total Establishment charges.	Percentage on the total outlay on works and repairs in the Irrigation Branch.		
1	10	11	12	13	14	15	16
	Rs.	Rs.	Rs.	Rs.		Rs.	
1921-22 ..	13,85,960	6,68,651	2,770	32,11,115	33·59	66,47,003	24·26
1922-23 ..	13,44,901	5,34,327	1,993	33,01,972	32·22	64,77,849	25·38
1923-24 ..	14,43,222	4,32,013	2,056	40,65,084	33·89	72,55,023	25·87
1924-25 ..	17,37,724	5,26,361	492	51,75,362	28·73	84,91,025	24·35
1925-26 ..	17,99,343	5,19,228	2,681	55,42,899	21·62	90,66,854	21·23
1926-27 ..	18,08,385	5,94,989	3,207	59,63,540	30·56	96,60,479	27·54
1927-28 ..	19,20,773	7,80,312	3,847	64,03,888	26·00	96,13,887	25·64
1928-29 ..	21,35,939	6,16,601	2,750	66,59,960	25·51	1,00,45,026	25·35
1929-30 ..	21,08,302	6,18,312	1,012	69,54,499	23·26	1,03,29,124	23·88
1930-31 ..	18,31,149	5,99,621	1,734	67,21,470	21·60	97,13,342	24·06
1931-32 ..	16,34,011	5,18,627	86	61,90,696	22·40	91,86,842	25·97
1932-33 ..	23,53,971	4,01,329	680	56,26,407	28·54	81,78,624	31·30
1933-34 ..	29,83,531	5,14,407	48,960	53,06,988	40 41	77,18,918	39·61
1934-35 ..	30,98,255	4,55,037	441	50,90,563	42 89	74,30,429	40·38

NOTE.—The percentage of the establishment charges on the cost of works and repairs in the Irrigation Branch (column 14) is generally higher than that in the Roads and Buildings Branch (column 8). The reason is largely that the establishment charges in the Irrigation Branch include the cost of Special Revenue Establishment employed entirely on "revenue management" work on certain canal systems in Sind and the Deccan which has no connection with the execution of works and repairs, and that these charges also include cost of part of the time of Irrigation establishment spent on revenue management including the *control and distribution of water*, which is debited in the accounts to "revenue management" and not to execution of works and repairs. If these establishment charges debited in the accounts to "revenue management" are deducted from the total cost of establishment in the Irrigation Branch the percentage on the cost of works and repairs will not be so divergent. The increase in the rate per cent. in the R. & B. Branch is mainly due to decrease in outlay on "works" and "repairs". Establishment charges cannot be reduced in the same ratio in which expenditure on works is reduced. A mere overall percentage on expenditure on works is inaccurate.

IRRIGATION ADMINISTRATION REPORT
BOMBAY PRESIDENCY—PART I
1934-35

PHYSICAL FEATURES—GENERAL DESCRIPTION OF IRRIGATION.

The area under irrigation in the Deccan and Gujarat is not compact. Rainfall is available for agricultural operations but is often precarious. Tanks and canals provide irrigation for valuable crops such as sugarcane and also provide a source of supply to other crops when the rainfall is deficient or irregular. The old irrigation works consist chiefly of a few small canals and moderately large tanks, some 12,000 smaller tanks mostly in the southern part and in Gujarat, and of about 400 bandharas in Nasik and Khandesh Districts. The tanks have earthen dams and the larger ones irrigate areas up to 1,300 acres, and the smaller ones up to 500 acres, situated immediately below and in the vicinity of the dams. The chief crop irrigated is rice. The bandharas are masonry weirs built across rivers to head up the water to a level sufficient to irrigate lands on the banks of the streams by means of channels taking off from the flanks of the bandharas. The areas irrigated are up to 800 acres and the chief crops are sugarcane, wheat, bajri and gram. From these small beginnings have evolved the magnificent irrigation works, which now form such a conspicuous feature in the Deccan and have so successfully fulfilled their beneficent purpose in banishing the famines which formerly devastated this portion of the Province.

2. The irrigation works in the Deccan are fundamentally different from those in Sind, the Punjab, Egypt or Mesopotamia, where wide alluvial plains have been formed by great deltaic rivers in perennial flow. The Bombay Deccan consists of a sloping table-land running eastward from the ridge of the Western Ghats. These form a ridge running parallel to the sea-coast at a distance from it of 50 to 100 miles; precipitous on the western side, they fall away more gradually to the east. The heaviest rainfall occurs on the peak of the ridge, where anything up to 270 inches of rain is recorded in the four monsoon months. The intensity of the rainfall rapidly decreases as we go eastward from the highest ridge, reaching a figure of 20 or 25 inches at a distance of 100 or 150 miles east of the Ghats. The rivers in the Deccan rise in the valleys close to the ridge, flow in an eastward direction, and are dry or practically so for 7 or 8 months of the year. The line of the Ghats, like the ridge of a roof, divides the rainfall into two parts; one the smaller portion falling westward into the Indian Ocean, and the other flowing through long lengths of tortuous rivers to the east and joining the rivers, which reach the sea on the south-eastern coast of the peninsula. These rivers are in flow during the

monsoon months only, and if no artificial means of conserving their waters were provided, the whole monsoon rainfall would be wasted so far as the Bombay Deccan is concerned, and would simply flow away to the sea, benefiting but to a small extent the country traversed.

3. The large irrigation systems in the Deccan are all of the same type. Each depends upon a storage lake near the head of one of the river valleys, where sufficient water is collected during the monsoon to supply the country on either side of the river valley below. The water stored during the rains is let out during the dry months of the year in accordance with requirements ; and at a point on the river, which may be as far as 50 miles from the main storage lake, a " pick-up-weir " is constructed across the river-course to divert the water into canals which take off on either side of the weir. In one case only, that of Lake Fife at Khadakwasla near Poona, do the canals take off from the flanks of the dam itself. The canals are always constructed at a considerably flatter slope than that of the river, and consequently are able to diverge from the river itself on each side of the valley ; as a rule each canal only irrigates the area between itself and the river.

SECTION I

COMPRISING IRRIGATION WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.

GENERAL REMARKS.

Works in operation.

4. The following list includes all the works in operation (43 in number) :—

Serial Number.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres.			
1	Hathmati and Khari Cut Canals.	24,000	Dependent on local rain.	No storage work. Bokh reservoir, Chandola tank and Wasai reservoir completed.	The catchment of the Hathmati river is hilly, covered partly with forest and that of the Khari is undulating ground at its source and then plain ground with cultivated fields. The supply depends upon the flow in the rivers, and the contents of the Bokh reservoir, Chandola tank and Wasai reservoir.
2	Wangroli Tank ..	3,400	Do. ..	Completed ..	The catchment is ordinary plain ground and cultivated fields
3	Savli Tank ..	3,000	Do. ..	Do. ..	Ordinary catchment on undulating ground.
4	Saiat Tank ..	2,000	Do. ..	Do. ..	Ordinary catchment on flat ground.
5	Tranza Nagrama Tanks.	800	Do. ..	Do. ..	The Tranza tank has no independent catchment. The Nagrama has a catchment of 1·5 sq. miles. Both are fed by the Matar drainage channel which is not reliable as it seldom flows.
6	Futelao Tank ..	800	Do. ..	Do. ..	Hilly catchment
7	Nira Left Bank Canal including Shotphal Tank.	100,000	Reliable ..	Lake Whiting (Lloyd Dam) completed.	Ghat catchment.
8	Nira Right Bank Canal.	180,000	Do. ..	Do. ..	Do.
9	Mhaswad Tank ..	14,000	Dependent on local rain.	Completed ..	Deccan catchment.
10	Mutha Canals including Matoba Tank.	49,000	Reliable ..	Lake Fife completed.	Ghat catchment.
11	Kasurdi Tank ..	40	Dependent on local rain.	Completed ..	Deccan catchment.
12	Shirsuphal Tank ..	1,150	Do. ..	Do. ..	Do.
13	Bhadalvadi Tank ..	1,225	Do. ..	Do. ..	Do.

Serial Number.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres.			
14	Godavari Right Bank Canal. Godavari Left Bank Canal.	44,000 26,000	Reliable ..	Lake Beale completed.	Ghat catchment.
15	Girna Canal.	9,000	Do. ..	Chankapur Tank completed.	Do.
16	Kadwa River Works. Palkhed Canal. Ojhar Tambat Canal. Wadali Canal.	7,689	Do. ..	Waghad Tank completed.	Do.
17	Parsul Tank ..	1,440	Dependent on local rain.	Completed ..	Deccan catchment.
18	Pravara Right Bank Canal. Pravara Left Bank Canal.	18,480 64,080	Reliable ..	Lake Arthur Hill (Wilson Dam) completed.	Ghat catchment.
19	Bhatodi Tank ..	1,461	Dependent on local rain.	Completed ..	Deccan catchment.
20	Ekruk Tank ..	13,070	Do. ..	Do. ..	Do.
21	Koreguon Tank ..	416	Do. ..	Do. ..	Hilly catchment.
22	Ashti Tank ..	3,382	Do. ..	Do. ..	Deccan catchment.
23	Pathri Tank ..	3,094	Do. ..	Do. ..	Hilly catchment.
24	Jamda Canals ..	42,000	Girna river supply not reliable.	Water is issued from the Chankapur Tank when available.	Ghat catchment for a small part and for the rest Deccan catchment.
25	Hartala Tank ..	978	Dependent on local rain.	Completed ..	Deccan catchment.
26	Mhaswa Tank ..	3,256	Do. ..	Do. ..	Do.
27	Shahada Channel ..	2,000	Reliable ..	No storage work ..	Hilly catchment. Supply is perennial.
28	Lower Panjhra River Works.	8,173	Panjhra river supply not reliable.	Mukti Tank completed.	Ghat catchment for one part and Deccan catchment for the rest.
29	Krishna Canal	6,412	Reliable ..	Proposed ..	Ghat catchment.
30	Rewari Canal ..	439	Dependent on local rain.	No storage work ..	Deccan catchment.
31	Upper Man River Works.	373	Do. ..	Pingli Tank completed.	Do.
32	Yerla River Irrigation Works.	1,182	Do. ..	Nehr Tank completed.	Do.
33	Chikhli Canal ..	358	Do. ..	No storage work.	Do.

Serial No.	Name of work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres.			
34	Maini Tank ..	455	Dependent on local rain.	Completed ..	Deccan catchment.
35	Gadikeri Tank ..	416	Do. ..	Do. ..	Do.
36	Gokak Canal ..	17,627	Reliable ..	Do. ..	Ghat catchment.
37	Muchkundi Tank ..	750	Dependent on local rain.	Do. ..	Deccan catchment.
38	Dambal Tank ..	531	Do. ..	Do. ..	Do.
39	Medleri Tank ..	231	Do. ..	Do. ..	Do.
40	Madag Tank ..	1,418	Do. ..	Do. ..	Ghat and Forest catchment.
41	Asundi Tank ..	503	Do. ..	Do.	Deccan catchment.
42	Dharma Canal ..	For monsoon season 6,580 acres. For rabi nil.	Do. ..	No storage work. The canal takes off from the river itself.	Forest catchment.
43	Mavinkop Tank ..	617	Do. ..	Completed ..	Do.

Ekruk tank, Gadikeri tank, Mavinkop tank and Shahada channel are the only productive works and the rest are unproductive.

5. The interest account for the year was as follows :—

	Productive Works.	Unproductive Works.	Total.
	Rs.	Rs.	Rs.
Total interest charges during 1934-35 ..	46,520	42,43,788	42,90,308
Net revenue realised during 1934-35 ..	1,15,950	13,34,717	14,50,667

Net loss, i.e. difference between interest and net revenue—Rs. 28,39,641.

6. The financial results of the year by main heads were as under :—

	Area irrigated.	Revenue realised.			Working expenses.	Net revenue.
		Direct receipts.	Share of land revenue.	Total.		
	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	5,042	1,42,138	11,642	1,53,780	37,830	1,15,950
Unproductive	209,211	28,27,727	14,578	28,42,305	15,07,588	13,34,717
Total ..	*214,253	29,69,865	26,220	29,96,085	15,45,418	14,50,667

* Inclusive of 8,910 acres under consolidated assessment.

The gross revenue and the net revenue show increases of Rs. 4,50,506 and Rs. 4,19,488 respectively, as compared with the figures for the previous year.

Areas irrigated, revenue, etc.

7. The figures of area irrigated, revenue assessed and realised and working expenses, as compared with those of the previous three years, are given below :—

Year.	Area irrigated.*	Revenue.		Working expenses.
		Assessment.	Realisations.	
	Acres.	Rs.	Rs.	Rs.
1931-32	207,151	24,22,599	18,81,119	15,35,282
1932-33	194,438	24,42,470	26,61,613	15,77,914
1933-34	213,047	24,04,530	25,45,579	15,14,400
Average ..	204,879	24,23,200	23,62,770	15,42,532
1934-35	214,253	25,66,862	29,96,085	15,45,418

* Inclusive of the area under consolidated water and land assessment.

8. The gross area under command is 1,799,000 acres. The area irrigable at present is 838,000 acres.

9. The state of Revenue collections was as follows :—

	Rs.	Rs.
Balance of demands unrealised at the commencement of the year		22,48,250
Demands of the year—		
Rabi, 1933-34 ..	3,52,287	
Kharif, 1934-35 ..	17,29,122	
Miscellaneous receipts ..	4,47,698	
		25,29,107
Total ..		47,77,357
Deduct—		
Remissions		80,718
Net total ..		46,96,639
Amount unrealised at the close of the year		17,12,341
	Rs.	
Actual receipts of the year ..	29,84,298	
Add—Share of land revenue ..	26,220	
		30,10,518
Deduct—Refunds of revenue		14,433
Revenue realised		29,96,085

The remissions and refunds together amounted to Rs. 1,06,938.

Unrealised irrigation revenue at the close of the year amounted to Rs. 17,12,341 which is made up as follows :—

	Rs.
Ekruk Tank	6,631
Hathmati and Khari Cut Canals	1,50,642
Bhadalwadi Tank	6,415
Krishna Canal	84,777
Ashti Tank	8,265
Shirsuphal Tank	4,889
Mutha Canals and Matoba Tank	1,57,649
Gokak Canal	7,278
Mhaswad Tank	12,550
Jamda Canals	8,172
Pathri Tank	6,068
Nira Left Bank Canal and Shetphal Tank ..	4,31,830
Kadwa River Works	60,859
Savli Tank	8,278
Chankapur Tank—Girna Canal	28,738
Godavari Canals	1,56,533
Nira Right Bank Canal	3,47,171
Pravara River Works	2,04,646
Other Works	20,950
Total ..	17,12,341

Working expenses.

10. The working expenses of the year amounted to Rs. 15,45,418 as compared with Rs. 15,14,400 during the previous year. The following table compares the charges under the principal heads with those of the previous three years :—

	1931-32.	1932-33.	1933-34.	1934-35.
	Rs.	Rs.	Rs.	Rs.
Works	11,619	11,124	23,069	38,862
Repairs	5,31,321	5,31,747	5,38,258	5,56,315
Establishment	9,38,363	9,64,429	8,84,686	8,69,891
Tools and Plant	8,567	10,023	8,019	9,177
Total in the Public Works Department ..	14,89,870	15,17,323	14,54,032	14,74,245
Collection charges	39,988	55,172	54,762	65,228
Indirect charges	5,424	5,419	5,606	5,945
Total working expenses ..	15,35,282	15,77,914	15,14,400	15,45,418

11. The following table gives the details of working expenses for some of the principal works :—

Details of working expenses.

Name of work.	Average incidence of water rate per acre.	Cost of measurement.		Working expenses in the P. W. Department.	
		Total cost.	Per acre.	Per mile of canal.	Per acre irrigated.
	Rs.	Rs.	Rs. a. p.	Rs.	Rs.
Nira Left Bank Canal and Shetphal Tank	10·10	1,195	0 0 5	2,213	3·87
Pravara Canals	16·35	584	0 0 6	1,991	8·44
Girna Canal	11·08	648	0 1 6	3,157	6·64
Godavari Canals	12·95	330	0 0 7	2,085	17·80
Mutha Canals and Matoba Tank ..	13·75	530	0 0 9	1,211	9·72
Kadwa River Works	8·65	150	0 0 6	1,351	8·10
Mhaswad Tank	4·81	150	0 0 6	302	9·41
Nira Right Bank Canal	9·74	630	0 0 3	2,056	12·85
Krishna Canal	15·47	503	0 2 11	335	5·56
Yerla River Irrigation Works ..	6·36	140	0 1 3	397	7·84
Upper Man River Works ..	5·65	40	0 1 4	368	13·60
Jamda Canals	5·97	36	0 0 4	427	8·56
Ekruk Tank	7·39	232	0 1 5	614	11·46
Ashti Tank	4·89	106	0 0 11	459	6·76
Maini Tank	5·44	70	0 0 1	546	4·84
Gokak Canal	5·74	423	0 0 11	235	1·76
Dharma Canal	5·60	148	0 4 11	119	0·56

12. The gross assessed revenue, direct and indirect, amounted to Rs. 25,66,862 as compared with Rs. 24,04,530 in the previous year. The details of the gross assessment are as under :—

Gross assessed revenue.

	Direct revenue.			Indirect revenue.	Total.
	Water rate.	Other receipts.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	21,345	1,13,890	1,35,235	11,642	1,46,877
Unproductive..	20,71,599	3,33,808	24,05,407	14,578	24,19,985
Total ..	20,92,944	4,47,698	25,40,642	26,220	25,66,862

The net assessed revenue of the year, after deducting working expenses (Rs. 15,45,418), amounted to Rs. 10,21,444 as compared with Rs. 8,90,130 during the previous year.

13. The following table gives the percentage return earned during the year on capital outlay on the principal works in operation :—

Name of work.	Total capital outlay (direct and indirect).	Gross receipts (direct and indirect).	Working expenses (direct and indirect).	Net revenue.	Percentage return on capital outlay.
	Rs.	Rs.	Rs.	Rs.	Rs.
Ekruk Tank	13,40,386	1,38,872	29,480	1,09,392	8·16
Hathmati and Khari Cut Canals ..	13,18,729	73,514	35,909	37,605	2·85
Nira Left Bank Canal and Shetphal Tank.	1,37,55,691*	5 58,708	2,36,837	3,21,871	2·33
Nira Right Bank Canal ..	4,12,75,100	2,91,506	3,35,251	—43,745	..
Mhaswad Tank	20,96,016	42,933	19,954	22,979	1·09
Mutha Canals and Matoba Tank ..	69,56,791	4,43,298	1,06,606	3,36,692	4·83
Godavari Canals	1,05,34,787	3,29,558	2,94,091	35,467	0·34
Chankapur Tank—Girna Canal ..	20,56,431	90,887	59,998	30,889	1·50
Kadwa River Works	10,35,876	18,944	32,639	—13,695	..
Pravara River Works	1,50,12,414	6,57,189	2,29,009	4,28,180	2·85
Lower Panjhra River Works ..	4,68,621	26,275	5,281	20,994	4·48
Krishna Canal	9,49,807	86,008	21,377	64,711	6·81
Gokak Canal	14,66,673	71,351	13,778	57,573	3·92

* Inclusive of proportionate expenditure on the old Bhatgar Dam and the New Lloyd Dam.

14. The average water rates per acre of land actually irrigated were :—

	Rs.
Productive works	7·21
Unproductive works	10·24

15. The water rate assessments and other receipts compare with those of the previous year as under :—

	1933-34.	1934-35.
	Rs.	Rs.
Water rates	19,68,823	20,92,944
Other receipts—		
Plantations	11,326	8,671
Water power	14,313	14,313
Miscellaneous	3,80,380	4,24,714
Total ..	4,06,019	4,47,698
Share of land revenue ..	29,688	26,220
Grand Total ..	24,04,530	25,66,862

16. The principal crop acreages irrigated during 1933–34 and 1934–35 are given below :—

Crop acreages.

	1933-34.	1934-35.
	Acres.	Acres.
Gardens and orchards	4,708	7,182
Sugarcane	36,296	35,777
Wheat	11,287	9,747
Rice	16,263	20,503
Jowar	35,380	29,730
Bajri	7,762	10,591
Gram, etc.	8,765	14,534
Groundnut	14,977	5,409
Cotton	19,880	17,152
Condiments	7,046	7,748

The total estimated value of the crops irrigated was Rs. 145·08 lakhs as compared with Rs. 119·88 lakhs during the previous year.

17. The following table shows the total number of ordinary wells in actual use, total area irrigated by them, etc., in the Deccan and Gujarat :—

Total number of ordinary wells in actual use.	Total area irrigated by wells shown in column 1 during 1934-35.	Total number of wells in working order but not used.	Total number of abandoned wells.
1	2	3	4
	Acres.		
303,104	690,571	52,599	53,077

DETAILED REPORTS BY LOCAL OFFICERS.

NORTHERN CIRCLE.

The year under review was characterized by the occurrence of a fairly good monsoon which broke in the middle of June and ended by the 10th September, a break of a fortnight occurring in the latter half of July. The rainfall received, although normal, was not sufficient for the watering of crops grown in the areas commanded by the Hathmati and Khari Cut Canals. Satisfactory rainfall was received, however, in the catchment areas of the Hathmati and Khari rivers which caused them to rise in flood on several occasions. The flood water was utilized for the purpose of filling the reservoirs and tanks commanded by the Hathmati and Khari Cut Canals and for the protection of the whole area transplanted with rice. The Kharif and Rabi crops were brought to maturity partly by the water of the Hathmati river and partly by water drawn from the storage of the Bokh Reservoir and other tanks served by that river.

The rainfall gauged at Ahmedabad and at Prantij was 31·63 and 35·13 inches, respectively, as compared with 43·31 and 40·75 inches, respectively, the average precipitation of the last three years. Similarly at Bareja, which is situated in the centre of the area irrigated by the Khari Cut Canal, the rainfall was 25·92 inches as compared with 31·77 inches, the average

of the last three years, while at Himatnagar, where the Head works of the Hathmati Canal are situated, it was 41·97 inches as compared with 35·06 inches, the average for the last three years.

The principal irrigation works in operation in this Circle are (1) the Hathmati and Khari Cut Canals, (2) the Wangroli Tank, (3) the Savli Tank, (4) the Saiat Tank, (5) the Tranza Nagrama Tanks and (6) the Futelao Tank.

No. (1) is a work which does not include any arrangement for storage and thus these canals depend solely on rainfall for their water supply.

The six works are financially unproductive, the annual revenue derived therefrom being generally insufficient to cover their working expenses.

AHMEDABAD AND KAIRA AND PANCH MAHALS DIVISIONS.

HATHMATI AND KHARI CUT CANALS.

This is the most important canal system in Gujarat. The Hathmati Canal irrigates a tract of land lying between the Sabarmati and Khari rivers and this system, in addition to irrigating the area dependent on it, is designed to pass surplus water, when available, first into the Bokh Reservoir and then into the Khari river direct *via* the Bhujwa Channel. The Bokh Reservoir does not provide any direct irrigational supplies but only acts as a storage reservoir for the Khari Cut Canal. Further downstream on the Khari river are situated two small irrigation systems and these utilise the natural flow of the river and also any surplus water which can be made available from the Hathmati Canal; the Khari water is abstracted at the so-called " Khari Sluices " for direct irrigational purposes, while the surplus water from the Hathmati is diverted through an artificial Cut, designated the Khari Cut, into a natural channel and this in its turn supplies a system of distributaries, several small tanks and the large Chandola tank situated near Ahmedabad. The system was first opened in 1873-1874 and has cost more than Rs. 13 lakhs.

The Hathmati river rose in flood on several occasions during the course of the year, the floods lasting for a longer period than usual. The greatest depth of water passing over the weir crest was 3·70 feet and this occurred on 18th August 1934 with a corresponding discharge of 29,699 cusecs. The area irrigated under this Canal during the year was 1,908 acres in the Kharif season and 3,665 acres in the Rabi season. The average daily discharge admitted into the Canal at its head during the Kharif season was 215 cusecs and of this quantity only 68 cusecs were utilized for irrigation served by this Canal, the balance being let down into the Bokh Reservoir and the Bhujwa Channel for supply to irrigation served by the Khari Cut Canal. During the Rabi season, the river gave an average daily discharge of 113 cusecs of which quantity 22 cusecs were taken for the replenishment of the Bokh Reservoir and the remaining 91 cusecs were utilized for irrigational purposes.

The Khari river was in flood on about 19 occasions during the whole of the Kharif season due to the satisfactory rainfall received in its catchment area. The maximum depth of the flood water was 9·80 feet which occurred on 7th July 1934 giving a discharge of 3,584 cusecs. Under the Khari Cut Canal 14,549 acres were irrigated in the Kharif season and 360 acres in the Rabi season.

The areas irrigated, the revenue assessed, and the working expenses in connection with the Hathmati and Khari Cut Canals compare with the average of the three preceding years as under :—

Year.	Kharif.		Rabi.		Total.		Working expenses
	Area irrigated.	Assessment.	Area irrigated.	Assessment.	Area irrigated.	Assessment.	
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Rs.
Average	8,78	51,473	2,734	8,055	11,418	59,528	35,676
1934-35	16,457	1,00,038	4,025	11,855	20,482	1,11,893	35,909

The remissions sanctioned during the year amounted to Rs. 1,444. The gross revenue realized from all sources amounted to Rs. 70,674, while the working expenses were Rs. 35,909 and these figures show a gross return of 2·63 per cent. on the total capital outlay.

The construction of the Lambha Branch of the Khari Cut Canal was in progress during the year, and a sum of Rs. 804 was spent in paying compensation for the land acquired and in carrying out earthwork in cutting. The total expenditure incurred, including the amount spent during the year, amounts to Rs. 3,311, as compared with the figure of Rs. 3,682, which is the estimated cost of the work.

First Class Irrigation Tanks in Gujarat.

The five first class tanks, viz. Wangroli, Savli, Saiat, Tranza Nagrama and Futelao, were constructed between the years 1904 and 1917 at an aggregate cost of Rs. 11 lakhs. They rarely yield any net return as the demand for water from them is small in years of good rainfall, while in years of scarcity the tanks themselves store deficient supplies. The first four tanks are situated in the Kaira Collectorate, while the last named is situated in the Broach and Panch Mahals Collectorate.

The areas irrigated, the revenue assessed and the working expenses in connection with the tanks during the year are compared with the average of the preceding three years below :—

Name of tank.	Year.	Kharif.		Rabi.		Total.		Working expenses.
		Area irrigated.	Assessment.	Area irrigated.	Assessment.	Area irrigated.	Assessment.	
1	2	3	4	5	6	7	8	9
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Rs.
Wangroli.. ..	Average ..	1,279	6,204	233	926	1,512	7,130	7,393
	1934-35 ..	1,065	5,673	436	1,743	1,501	7,416	7,260
Savli	Average ..	1,659	8,373	3	10	1,662	8,383	6,221
	1934-35 ..	2,103	10,714	10	34	2,113	10,748	6,428
Saiat	Average ..	380	1,537	74	293	454	1,830	4,396
	1934-35 ..	250	1,342	405	1,628	655	2,970	3,596
Tranza Nagrama ..	Average ..	32	106	4	17	36	123	2,177
	1934-35 ..	150	593	13	52	163	645	2,780
Futelao	Average ..	9	71	44	134	53	205	1,385
	1934-35 ..	18	32	44	137	62	169	1,369

Wangroli Tank.

The rainfall gauged at the site of the tank was 49·25 inches. The tank nearly filled during the year under report and the water was utilized for the irrigation of Kharif and Rabi crops (mainly rice, wheat and gram). The miscellaneous revenue amounted to Rs. 1,124 as compared with Rs. 1,067 received during the previous year.

Savli Tank.

The rainfall gauged at the site of the tank was 39·13 inches. The tank filled to its F.S.L. and the water was utilized for the irrigation of Kharif crops which consisted mainly of rice. The extent of Rabi irrigation was negligible. The miscellaneous revenue realized during the year amounted to Rs. 1,213 as compared with the amount of Rs. 1,116 received during the previous year. The amount of remission sanctioned during the year was Rs. 4-4-0.

Saiat Tank.

The rainfall gauged at the site of the tank was 46·44 inches. The tank filled to its F.S.L. and the water was utilized for the irrigation of both Kharif and Rabi crops, these consisting mainly of rice wheat and gram. The miscellaneous revenue realized during the year amounted to Rs. 772 as compared with the amount of Rs. 724 received in the previous year.

Tranza Nagrama Tanks.

The rainfall gauged at the tanks was 28·88 inches. The tanks partially filled during the year, the supply being utilized for the irrigation of the rice crop in the Kharif season and wheat and gram in the Rabi season. The miscellaneous revenue realized during the year amounted to Rs. 847 as compared with the sum of Rs. 538 of the previous year. Remission to the extent of Rs. 12-11-0 was sanctioned during the year.

Futelao Tank.

The rainfall gauged at the site of the tank was 17·18 inches. The tank filled partially only due to the inadequate rainfall received and consequently the extent of irrigation in the Kharif and Rabi seasons was not appreciable. The miscellaneous revenue realized amounted to Rs. 70 as compared with the amount of Rs. 42 received in the previous year.

The percentage returns obtained during the year from the working of these tanks are shown below :—

Name of tank.	Gross assessment.	Gross realisations.	Working expenses.	Net revenue.	Capital outlay direct and indirect to end of 1934-35.	Percentage return.
	Rs.	Rs.	Rs.	Rs.	Rs.	
Wangroli	8,540	7,695	7,260	435	2,93,295	0·15
Savli	11,961	7,413	6,428	985	2,55,210	0·39
Saiat	3,742	2,667	3,596	— 929	1,84,029	—0·50
Tranza Nagrama ..	1,492	2,315	2,780	— 465	2,80,635	—0·17
Futelao	239	317	1,369	—1,052	1,16,461	—0·90

DECCAN IRRIGATION CIRCLE.

In the Nira Left Bank Canal and Mutha Canal tracts rainfall was below normal. In the Pravara Canals tract the monsoon set in earlier than usual and the rains were both satisfactory and well distributed. In the Godavari Canals tract the monsoon broke in July and was satisfactory in the catchment and along the canal tract. The general condition of irrigated crops under all canals and tanks in the Nasik Irrigation Division and Pravara Canals in the Ahmednagar Division was very satisfactory till the 3rd week of January when a cold wave of two days' duration descended on parts of Nasik and Ahmednagar Collectorates causing varying degrees of damage to crops. Damage to irrigated crops was severe in certain parts of the canal areas under the Godavari and Kadwa Canals.

The 'gul' rate throughout the year was comparatively high. The following six sugar factories have been established on the Deccan Canals and the acreages likely to be eventually irrigated under sugarcane every year in these factory areas are noted against each :—

Name of sugar factory.	Acres.	Capacity in tons per day.
1. The Belapur (Sugar) Company, at Harigaon, Pravara Left Bank Canal ..	2,750	600
2. The Maharashtra Sugar Mills Limited near Belapur, Pravara Left Bank Canal	1,250	250
3. Messrs. Marsland Price and Company Limited at Kalamb, Nira Left Bank Canal	1,400	300
4. The Phaltan Sugar Works Limited near Tadavli, Nira Right Bank Canal ..	2,500	500
5. The Saswad Mali Sugar Factory Limited near Akluj, Nira Right Bank Canal ..	1,200	300
6. The Ravalgaon Sugar Farm Limited near Malegaon, Girna Canal	1,400	200

No factories have yet been constructed by—

(1) The Brihan Maharashtra Sugar Syndicate Limited, Nira Right Bank Canal,

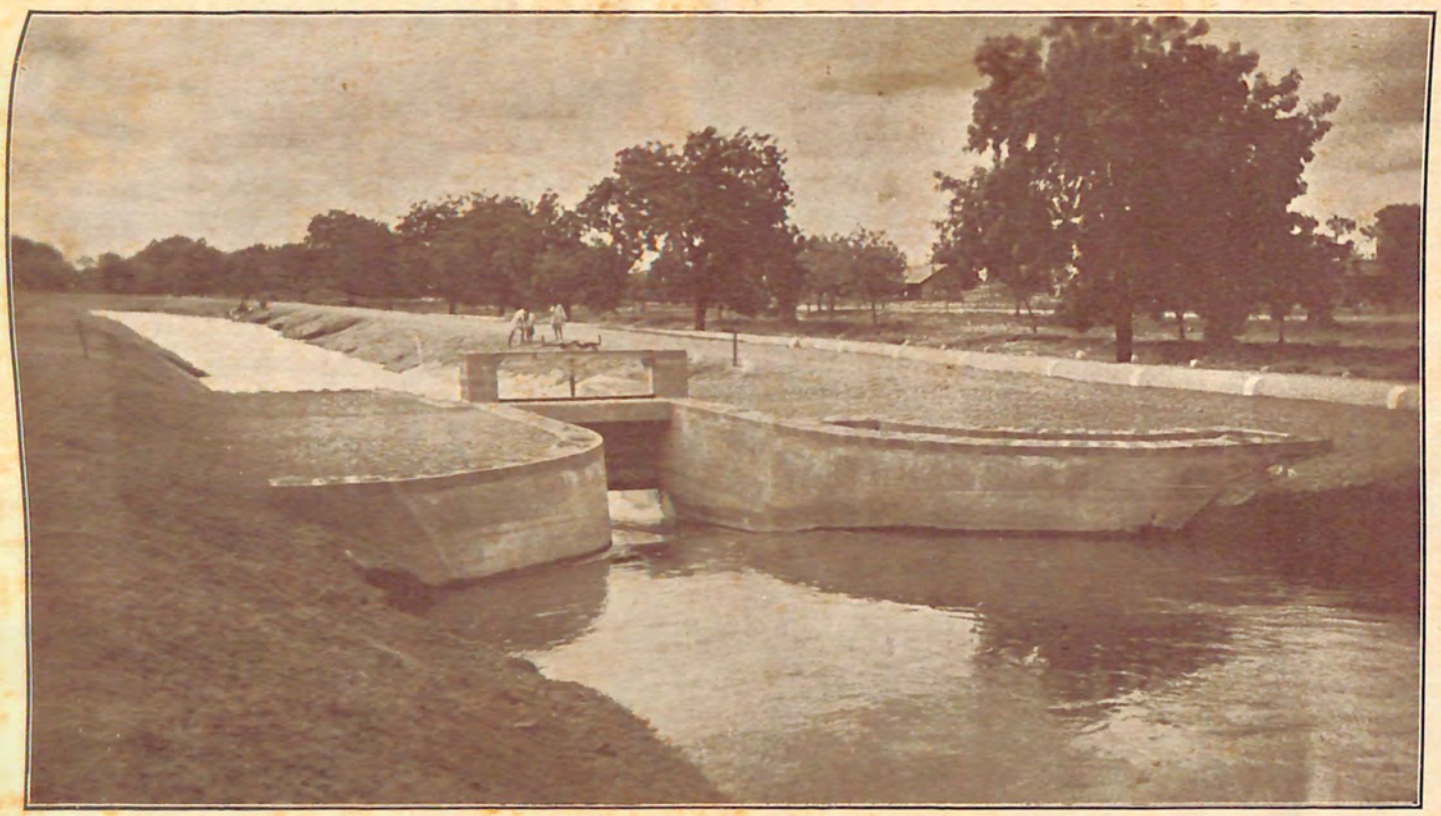
(2) The Belwandi Sugar Farm, Visapur Canal,

but sugarcane has been planted for the purpose of seedling cane in the case of item No. 1, and for the purpose of making 'gul' in the case of item No. 2.

The areas of sugarcane planted by the sugar factories during the year were 9,325 acres, excluding overlapped cane.

Due to intensive cultivation of sugarcane by the sugar companies lands are likely to be damaged by water-logging and the question of providing for the adequate drainage of such lands is under consideration.

The total area irrigated in the Deccan Irrigation Circle during the year was 155,276 acres as compared with 155,741 acres during the previous year and the gross revenue amounted to Rs. 20·43 lakhs as compared with the figure of Rs. 18·52 lakhs for the previous year.

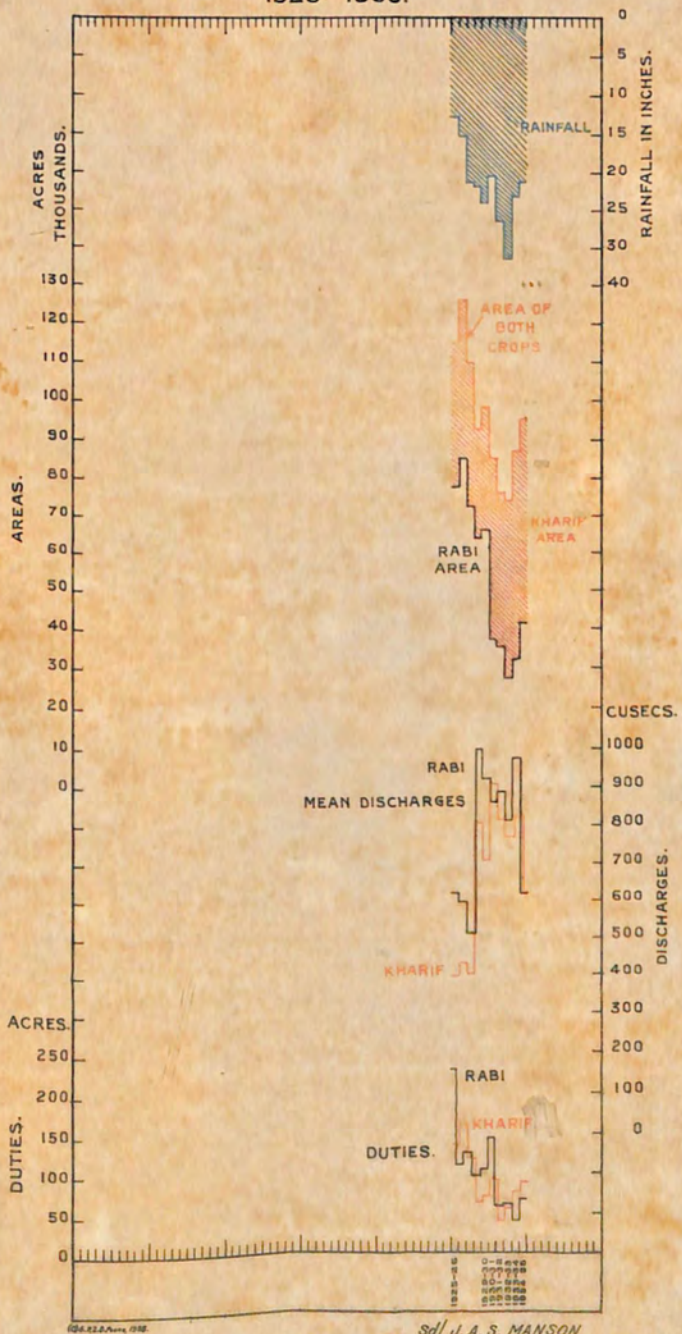


G. P. Z. P. 1936.

NIRA LEFT BANK CANAL.

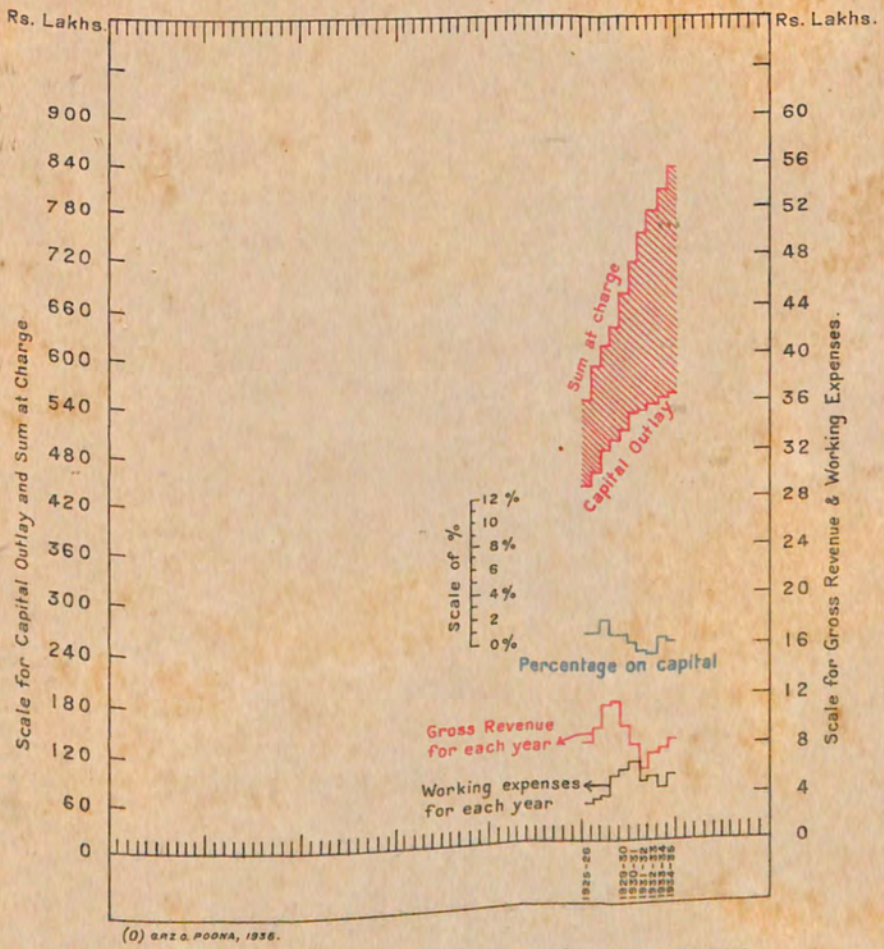
Combined standing-wave flume and stop-gate, canal mile 42.
Designed discharge 550 cusecs.
Upstream view.
Work completed in 1934.
Cost Rs. 5,688.

WORKING RECORD
FOR
NIRA RIGHT & LEFT BANK CANALS
1925 - 1935.



Sd/ J. A. S. MANSON
EXECUTIVE ENGINEER,
NIRA R.B. CANAL DIVISION.

FINANCIAL RECORD
FOR
Nira Right & Left Bank Canals.
1925-1935.



(0) GRZ O. POONA, 1936.

Sd/- J. A. S. MANSON

Executive Engineer,
Nira R. B. Canal Division.

NIRA RIGHT BANK CANAL DIVISION.

LLOYD DAM AT BHATGAR AND NIRA RIGHT BANK CANAL.

The Lloyd Dam and the first 15 miles of the Nira Right Bank Canal, which were previously under the control of the Nira Right Bank Canal Division, were transferred to the jurisdiction of the Poona Irrigation Division on 19th June 1934 for reasons of administrative convenience.

The Nira Right Bank Canal is the largest canal in the Deccan. The original estimate of the Project framed in 1910 provided for—

(1) The raising of the Dam at Bhatgar by 60 feet in order to increase its storage capacity from 5,300 million cubic feet to 24,000 million cubic feet.

(2) The construction of a canal 109 miles long on the right bank of the Nira river having a capacity of 1,500 cusecs at its head, and

(3) The widening of the existing Nira Left Bank Canal in order to increase its discharge from 450 to 760 cusecs.

The total cost was estimated at about Rs. 258 lakhs and the area to be irrigated annually at 190,000 acres. The project was submitted to the Government of India in May 1911, sanctioned by the Secretary of State in June 1912 and the work was started in the same year. Before the work of raising the Bhatgar dam was commenced, however, it was decided for technical reasons to build an entirely separate structure. Owing to this change and to the unprecedented rise in the cost of labour and materials due to the Great War, a revised estimate amounting to Rs. 491 lakhs was framed in 1920 and submitted to the Government of India in September 1921. The revised project provided for :—

(1) The construction of a new dam at Bhatgar designed to increase the storage from 5,300 million cubic feet to 24,000 million cubic feet.

(2) The construction of a canal on the right bank of the Nira River 106½ miles long, and

(3) The enlargement of the Nira Left Bank Canal, including the expenditure of Rs. 3¾ lakhs already incurred on widening the Nira Left Bank Canal.

It was anticipated that 132,000 acres would be irrigated annually as a result of this scheme and that the gross revenue would thus amount to Rs. 15·22 lakhs and the net revenue to Rs. 11·92 lakhs yielding a return of 2·4 per cent. on the capital outlay. The revised project was sanctioned by the Secretary of State in June 1922.

The Lloyd Dam at Bhatgar, 190 feet high, 5,333 feet long including the waste weir (4,266 feet long excluding the waste weir) and 124 feet wide at the base, was completed in 1928 at a cost of Rs. 172 lakhs. It is one of the largest dams in the world and contains 21½ million cubic feet of masonry. The lake formed by the construction of the dam has a length of 17 miles at full supply level with a corresponding storage capacity of 24,000 million cubic feet. The catchment area is 128 square miles in extent with an annual rainfall varying from 300 inches in the Ghats to 40 inches at Bhatgar. In addition to the sluices required for the release of water for irrigation purposes, 81 waste weir gates have been provided for the control and regulation of the flood level in the lake.

The Nira Right Bank Canal has its head works at Vir, 17 miles from the Lloyd Dam. The designed discharges of the canal at head and at tail are 1,500 and 414 cusecs respectively, the corresponding full supply depths being 8·5 and 6·5 feet. The canal, about 106½ miles in length, commands lands situated in the Satara and Sholapur Districts and Phaltan State. Water was first supplied from the canal for the irrigation of rabi crops in 1924–25. The works on the main canal are completed. There are three branches and 69 distributaries taking off from the canal, while the culturable area commanded by it is 448,000 acres. The water regulation and distribution arrangements on the canal are constructed on modern lines and the latest types of S. W. flume measuring devices are provided at distributary heads on the channels. The whole of the perennial area under the canal has been carefully surveyed and the soil classification was carried out before designing the channels, while the lands suitable for perennial and other crops have been carefully determined by the Irrigation Research Division and shown on maps.

On the 1st April the level of the water in Lake Whiting at Bhatgar was 96·20 feet (Full Supply Level 143 feet) above the sill of the sluices, the corresponding contents being 8,621·97 million cubic feet. The lowest level of 67·40 feet was reached on the 18th June, the corresponding contents being 2,653·52 million cubic feet. The lake filled to its Full Supply Level of 143 feet on the 1st September and was maintained at that level till the 14th September, when the draw-off for irrigation purposes commenced. On the 31st March the water level was at 112·50 feet, the corresponding contents being 13,337·99 million cubic feet. The rainfall at the site of the dam was 39·66 inches and that in the canal tract averaged 23·19 inches. The run-off from the catchment of the lake (128 square miles) amounted to 33,073·77 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the corresponding averages of the past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1934–35.	Average.	1934–35.	Average.	1934–35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
26,073	25,319	2,54,051	1,32,829	2,62,367	1,39,423

Working expenses.		Realisations.		Rainfall.	
1934–35.	Average.	1934–35.	Average.	1934–35.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
3,35,251	2,64,111	2,91,506	72,194	23·19	25·92

The area under sugarcane including "overlapped cane" was 5,824 acres as compared with the figure of 3,361 acres of the previous year; the areas of sugarcane blocks and two-seasonal blocks were 3,434 acres and 9,930 acres, respectively, as compared with the figures of 3,777 and 12,690 acres of the previous year. The area of garden and fruit blocks was 108 acres. The remissions sanctioned during the year amounted to Rs. 4,727. The cost of the measuring establishment employed was pies 3 per acre—the same as last year. The perennial section of the Nira Right Bank Canal extended up to mile 79.

Mhaswad Tank.

This irrigation tank is formed by an earthen dam built across the Man river, the dam being 9,000 feet long and 80 feet high at its highest point. The tank which is situated on the eastern border of the Satara District has a storage capacity of 2,602 million cubic feet and supplies water for the irrigation of lands situated in the Sholapur District. Owing to the precarious nature of the rainfall received in the catchment area the supply is not reliable, although in recent years the tank has been fully replenished for eight years in succession. The tank is provided with a masonry overflow waste weir designed to deal with flood conditions. The project was commenced in 1876–77 and completed in 1888–89. There is only one canal taking off from the left flank of the dam—previously called Mhaswad canal No. 1 and now termed Mhaswad canal Part I. The designed discharge of the canal is 180·7 cusecs whereas the present actual discharge is about 110 cusecs with a full supply depth of 4 feet. This canal discharges its contents into the Katphal Tank which is situated nine miles downstream of the Mhaswad Tank. The Mhaswad Canal Part II takes off from the Katphal Tank, the designed discharge of the canal being 176·93 cusecs with a full supply depth of 3 feet. The present carrying capacity of the channel is only about 80 cusecs due to silting. No water from the Nira Right Bank Canal is now available for Branch No. III of the Nira Right Bank Canal System and the irrigation on this branch was carried out with water obtained from the Mhaswad Tank with effect from the rabi season of 1934–35.

On the 1st April, the level of water in the tank was 18·80 feet (the full supply depth being 24 feet), the corresponding contents were 1,770·29 million cubic feet. The tank began to receive replenishment with effect from 15th May and reached its full supply level of 24 feet on the 13th October, the corresponding contents being 2,602 million cubic feet, which made it possible to satisfy the full demands of the rabi season. On 31st March 1935, the level of the water in the tank was 20 feet, the corresponding contents being 1,948·37 million cubic feet. The average rainfall in the catchment of the tank (480 square miles) was 23·88 inches and the run-off amounted to 6,769·11 million cubic feet while the average rainfall in the canal tract was 24·59 inches.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the average of past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
2,120	5,791	10,192	23,731	14,272	27,728

Working expenses.		Realisations.		Rainfall.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
19,954	18,670	42,933	27,378	24·59	20·90

The area cultivated under sugarcane on two-seasonal passes was 24 acres as compared with 69 acres during the previous year. The cost of the measuring establishment employed was 6 pies per acre as compared with the same figure for the previous year.

POONA IRRIGATION DIVISION.

NIRA LEFT BANK CANAL.

This canal forms part of the scheme known as the Nira Valley Development Project and irrigates lands situated on the left bank of the Nira river. It is one of the pioneer irrigation works in the Deccan and protects a tract in the Poona District which receives a very precarious rainfall. The original scheme consisted of :

(*a*) A ghat-fed storage tank at Bhatgar (Lake Whiting) about 32 miles south of Poona on the Yelwandi river, impounding 5,300 million cubic feet of water ;

(*b*) A pick-up weir at Vir on the Nira river about 17 miles downstream from Bhatgar ;

(*c*) A canal about 100 miles long irrigating about 80,000 acres annually ; and

(*d*) The Shetphal Tank at the tail of the canal with an effective capacity of 592 million cubic feet for the purpose of storing a portion of the surplus monsoon discharge.

The original masonry dam at Bhatgar, 127 feet high, has since been replaced by the higher Lloyd Dam mentioned above. The original works were commenced in 1881 and the canal came into operation in 1885-86. The canal originally had a capacity of 456 cusecs but it has now been remodelled in order to carry a discharge of 720 cusecs. A maximum

discharge of 708 cusecs was provided during the year. The canal, together with the tank, commands a gross area of 201,000 acres while the area commanded by the Shetphal Tank itself is 23,500 acres. The culturable area under the canal is 149,821 acres.

Nira Valley Development Project.

This project was designed for the complete development of irrigation in the Nira Valley; it provided, *inter alia*, for the widening and remodelling of the Nira Left Bank Canal in order that this canal could irrigate an additional area of 19,000 acres of various types of crops and the construction of a new dam at Vir designed to supplement the storage of 24,000 million cubic feet impounded by the Lloyd Dam at Bhatghar. The construction of the Vir Dam, estimated to cost about a crore of rupees, has, however, been held in abeyance. Of the various works comprising the Nira Valley Development Project of 1922 the only work in charge of the Poona Irrigation Division was the enlarging and remodelling of the Nira Left Bank Canal. The remodelling of the Nira Left Bank Canal, which was started in 1925-26, has made considerable progress. The work of remodelling the distributaries was in progress, the total expenditure incurred during the year being Rs. 1,14,293. The remodelling of the canal is expected to be completed by the end of 1936-37.

The rainfall at Bhatghar was 43·78 inches as compared with 44·22 inches, the average rainfall received during the past 33 years. The rainfall for the year was below normal and unsatisfactory. The water in the Shetphal Tank reached its lowest level of 30·30 feet on the 28th September, the corresponding contents being 357·30 million cubic feet. Replenishment from the canal was given shortly after that date and the tank reached a level of 35·05 feet on the 10th November.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the average of previous three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
57,928	54,446	5,85,160	5,87,330	5,92,085	5,94,518

Working expenses.		Realisations.		Rainfall.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
2,36,837	2,84,404	5,58,708	6,06,009	19·40	27·40

The area of sugarcane blocks during the year was 14,583 acres on the Nira Left Bank Canal and that on the Shetphal Tank was 1,568 acres as compared with 17,208 and 1,968 acres respectively, during the previous year. The area under two-seasonal blocks on the Nira Left Bank Canal was 17,235 acres and on the Shetphal Tank was 650 acres as compared with 15,676 and 679 acres respectively, during the previous year. Remissions on account of the concession for "overlapped sugarcane" were granted during the year. The expenditure incurred on the measuring establishment employed was equivalent to a figure of 5 pies per acre, i.e. the same figure as was obtained last year. The perennial section of the Nira Left Bank Canal extended up to mile 90 and that of the Shetphal Tank up to outlet No. 22 of the Shetphal Channel. The cost of maintenance and repairs (including special repair works) to this canal system amounted to Rs. 75,535.

Mutha Canals.

This system came into operation in 1874–75. The canals were constructed at a cost of about Rs. 65½ lakhs, including the cost of the dam at Khadakwasla which impounds a large ghat-fed storage reservoir (Lake Fife) on the Mutha river at Khadakwasla, 11 miles from Poona. The scheme comprises two canals, the Mutha Right Bank and Left Bank Canals, 70 and 18 miles in length, respectively. The dam is 107 feet high and spans the valley of the Mutha. The maximum designed discharges of the two canals at their heads are 412 and 38·5 cusecs, respectively. Lake Fife has a storage capacity of 3,955 million cubic feet of which 508 million cubic feet are reserved for the Poona Water Supply System as a margin of safety in the event of late replenishment occurring. The storage is partly used for drinking and domestic purposes in Poona and partly for irrigation. The supply available for irrigation being insufficient the perennial limit of the Mutha Right Bank Canal is restricted to the reach between the head of the canal and mile No. $23\frac{5}{8}$, i.e., up to and including Distributary No. 9. The Matoba Tank is a "tail" tank receiving its supply from the Mutha Right Bank Canal during the monsoon months.

On the 1st April, the level of water in Lake Fife was 18·95 feet above the sill of the canal sluices, the corresponding contents being 1,551 million cubic feet as compared with 19·65 feet and 1,629 million cubic feet, respectively, in the previous year. The lowest level of 9·40 feet was reached on the 17th June when replenishment commenced and the lake overflowed on the 20th July. The water in the lake remained at the full supply level of 34 feet (contents 3,643 million cubic feet) from the 1st October up to the 13th November and the draw-off commenced on the 14th November. The run-off from the catchment of the lake (196 square miles) amounted to 47,830·98 million cubic feet. The level of water on the 1st March was 21·30 feet, the corresponding contents being 1,816 million cubic feet as compared with 19 feet (contents 1,557 million cubic feet) in the previous year. The rainfall at Khadakwasla was 32·15 inches as compared with 51·05 inches in the previous year. The level of water in the Matoba Tank on the 1st April was 13·48 feet,

the corresponding contents being 28·93 million cubic feet, as compared with 13·02 feet and 29 million cubic feet, respectively, in the previous year. Replenishment from the Mutha Right Bank Canal commenced from the 6th July but was stopped for some time owing to a breach in the canal. The full supply level of the tank, viz. 29 feet, was not reached during the year, the maximum level obtained being 28·40 feet on the 10th November, the corresponding contents being 208·42 million cubic feet. The level of water on the 1st March was 18·25 feet, the corresponding contents being 63·57 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed etc. during the year as compared with the average of the past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
11,139	11,951	1,53,081	1,76,887	3,49,889	3,63,864

Working expenses.		Realisations.		Rainfall.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
1,06,606	1,05,711	4,43,298	3,73,913	16·33	24·50

The area cultivated under sugarcane was 2,610 acres. The area under two-seasonal blocks on the Mutha Canals was 783 acres and that on the Matoba Tank was 1,107 acres. The quantities of water supplied to the Poona Cantonment and Poona City Municipality during the year were 1,069 and 2,882 million gallons, respectively, as compared with 998 and 2,426 million gallons, respectively, in the previous year; the revenue assessed amounted to Rs. 42,828 and Rs. 1,33,860 respectively, as compared with Rs. 39,913 and 1,08,842 respectively, during the previous year. The cost incurred on the measuring establishment employed was equivalent to a figure of 9 pies per acre as compared with the figure of 8 pies of the previous year. The expenditure incurred during the year on the work of remodelling the first 11 miles of the Mutha Right Bank Canal amounted to Rs. 3,000. The expenditure incurred on maintenance and repairs amounted to Rs. 38,265 as compared with Rs. 41,790 during the previous year. The remissions sanctioned during the year amounted to Rs. 68.

Kasurdi Tank.

This tank, which remained empty from the 8th January 1934, received replenishment on the 10th June and dried up on the 3rd July. It received

a second replenishment on 28th September and again dried up on 14th February 1935. The tank, being heavily silted, irrigated an area of only 41 acres during the year.

Shirsuphal Tank.

On the 1st April, the level of the water in the tank was 25·30 feet, the corresponding contents being 188·90 million cubic feet. The lowest level, viz., 17·50 feet, was reached on the 27th September. The water in the tank reached its highest level of 21·20 feet on the 3rd November, the contents then being 111·43 million cubic feet. On the 31st March 1935, the level of the water in the tank was 11·60 feet, the corresponding contents being 22·46 million cubic feet.

Bhadalwadi Tank.

On the 1st April, the level of the water in the tank was 29·40 feet, the corresponding contents being 117 million cubic feet. The lowest level of 27·50 feet was reached on the 27th September, the corresponding contents being 95·67 million cubic feet. The water in the tank reached its highest level of 36·50 feet on the 2nd November, the corresponding contents being 207·98 million cubic feet. On the 31st March 1935 the level of water in the tank was 31·20 feet, the corresponding contents being 138·93 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year, as compared with the average of the past three years :—

Name of tank.	Area irrigated.		Water rates. assessed.		Gross assessed. revenue.	
	1934-35	Average.	1934-35.	Average.	1934-35.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Kasurdi	41	50	220	196	249	1,278
Shirsuphal	1,154	1,014	6,236	6,001	6,478	6,112
Bhadalwadi	763	906	3,760	5,577	3,844	5,736

Name of tank	Working expenses.		Realisations.		Rainfall.	
	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Kasurdi	1,135	1,106	315	1,244	12·59	15·18
Shirsuphal	3,084	3,328	5,060	5,840	13·29	20·63
Bhadalwadi	2,760	4,051	4,479	5,315	18·85	19·70

NASIK IRRIGATION DIVISION.

GODAVARI CANALS.

This is one of the major irrigation works undertaken in the Deccan for the protection of areas liable to famine. It was started in 1907 and completed in 1915–16 at a cost of about 1 crore of rupees. The system comprises :—

(1) A storage reservoir (Lake Beale) on the Darna river, a tributary of the Godavari, situated about 20 miles from Nasik ;

(2) A pick-up weir at Nandur-Madhmeshwar on the Godavari, 47 miles below the Darna dam, which impounds the water released from the storage reservoir ; and

(3) Two canals, the Right Bank Canal, 69 miles long, which serves the northern tracts of the Ahmednagar District and the Left Bank Canal, 48 miles long, which irrigates lands north of the Godavari Valley in the Nasik and Ahmednagar Districts.

The length of the Darna Dam (inclusive of its waste weir) exceeds a mile and the dam has a maximum height of 92 feet above its lowest foundation level. The lake has a storage capacity of 7,763 million cubic feet, and the cost of the dam was Rs. 34·27 lakhs. The weir at Nandur-Madhmeshwar is a work of considerable magnitude, its length being 3,618 feet inclusive of the Right and Left Bank Canal regulators. It has a maximum height of 34 feet above the level of the river bed. Scouring sluices have been constructed close to the head regulators of the two canals with the object of keeping the approach channels to the latter clear of silt. The total area under the command of the canals is 232,390 acres. The two canals (Right and Left) are designed to discharge 384 and 228 cusecs at their heads, respectively, with full supply depths of 7 feet and 6 feet respectively.

On the 1st April, the level of the water in Lake Beale was 42·97 feet above the sill level of the sluices, the corresponding contents being 2,500 million cubic feet. The lowest level reached was 24 feet on 19th June, the contents being 799·83 million cubic feet when the lake began to receive replenishment, until it overflowed the waste weir sill on the 8th July. The draw-off for irrigation commenced on the 26th October with a water level of 63·80 feet, the corresponding contents being 7,350 million cubic feet. On the 31st March, the level of the water was 51·5 feet, the contents the nbeing 3,960 million cubic feet. The lake has a storage capacity of 7,763 million cubic feet. The catchment area is 156 square miles in extent of which 80 square miles is a typical ghat catchment producing a very reliable supply. The average rainfall in the catchment area was 56·71 inches, while that in the canal tracts was 20·66 inches on the Godavari Right Bank Canal and 20·05 inches on the Godavari Left Bank Canal. A part of arch No. 4 of culvert No. 2 situated in mile 2 of the Godavari Left Bank Canal collapsed on the 22nd January 1935. Immediate measures were taken to divert the canal over the downstream length of the culvert and the supply of water was restored within a week of the occurrence of the collapse. A cold wave of 2 days

duration in January 1935 caused damage to irrigated crops and relief by way of remissions and suspensions of irrigation dues was given on this account.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the average of the past three years :—

Name of work.	Area irrigated.		Water rates assessed.		Gross assessed revenue.	
	1934-35	Average.	1934-35.	Average.	1934-35.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Lake Beale	621	433	1,995	1,587		
Godavari Right Bank Canal	8,353	9,411	1,08,314	1,43,914	2,37,347	2,91,044
Godavari Left Bank Canal .	7,697	7,324	1,05,654	1,19,280		

Name of work.	Working expenses.		Realisations.		Rainfall.	
	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Lake Beale					....	....
Godavari Right Bank Canal	2,94,091	2,94,665	3,29,558	3,23,007	20·66	25·54
Godavari Left Bank Canal .					20·05	27·21

The area of perennial blocks sanctioned was 7,888 acres on the Godavari Canals as compared with 9,897 acres in the previous year. The perennial limit of the Godavari Right Bank Canal extends up to mile 60, while that of the Left Bank Canal extends up to mile 42. The cost of the measuring establishment employed was equivalent to a figure of 7 pies per acre, i.e. the same figure as was obtained last year. The remissions sanctioned during the year amounted to Rs. 26,118 and refunds to Rs. 45.

The preparation of the Waldevi Tank project, designed to provide, *inter alia*, for a supply of water for domestic purposes to Nasik Town, Deolali Cantonment, the G. I. P. Railway, etc., was in progress during the year under report.

Chankapur Tank—Girna Canal.

This is a comparatively small irrigation system situated in the Nasik District, having its storage reservoir situated at Chankapur, fed from

a catchment of 100 square miles in extent and its pick-up weir at Thengoda, situated further downstream on the Girna river from which weir the Girna Left Bank Canal (19 miles in length) takes off. The tank is situated on the Girna river, a tributary of the Tapti, and has been formed by the construction of a masonry dam 140 feet high, which impounds 1,500 million cubic feet of water. The dam and the canal up to mile 13 were completed in 1909–10 and the canal has been in operation since that year. The extension of this canal, designed to carry about 40 cusecs, up to mile 19 was completed in 1920–21. The total area under the command of the canal is 29,182 acres and the irrigable area is 8,500 acres. The designed discharge of the canal at its head is 90 cusecs, the full supply depth being 4½ feet.

On the 1st April, the level of the water in the tank was 82·95 feet, the corresponding contents being 1,063 million cubic feet. The level fell to 49·60 feet on the 8th July when replenishment commenced. Due to the occurrence of the highest flood on the 13th September the level of water rose to 91·20 feet, the corresponding contents being 1,497 million cubic feet. The draw-off for irrigation purposes commenced on the 26th November with the level of water at 89·85 feet, the corresponding contents being 1,414 million cubic feet. The level of water on the 31st March was 78·75 feet, the contents then being 892 million cubic feet. The run-off from the catchment of the tank (100 square miles in extent) was 5,797 million cubic feet with an average rainfall of 40·73 inches.

The following table gives the figures of area irrigated, revenue assessed, etc. during the year as compared with the average of the past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
7,816	5,283	86,568	44,876	86,892	45,699

Working expenses.		Realisations.		Rainfall.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
59,998	53,829	90,887	45,174	14·30	27·41

The cost of the measuring establishment employed was equivalent to one anna six pies per acre as compared with the same figure obtained during the previous year. The remissions sanctioned during the year amounted to Rs. 3,882 which was due to the damage caused to irrigated crops by the cold wave that occurred during January 1935.

KADWA RIVER WORKS.

These works, which came into operation in 1868–69, consist of three small canals, viz. the Palkhed, Ojhar Tambat and Wadali, taking off from weirs constructed across the Kadwa river and its tributary the Banaganga and the system comprises 38 miles of canals and distributaries. The storage reservoir is at Waghad (a ghat-fed storage) situated on the Kolwan river in the Nasik District. The catchment of the tank is 29 square miles in extent. The tank is remarkable for the size of its earthen dam which has a maximum height of 96 feet. The designed discharges of the Palkhed canal at its head and at its tail are 90 and 15 cusecs, respectively, the corresponding depths at full supply being 4½ feet and 2 feet. The designed discharges of the Ojhar Tambat canal at its head and at its tail are 33 and 5 cusecs, respectively, the depths at full supply being 3 feet and 1 foot, respectively. The designed discharges of the Wadali canal at its head and at its tail are 19 and 5 cusecs, respectively, the depths at full supply being 2 feet and 1 foot, respectively.

On the 1st April, the level of the water in the Waghad Tank was 38 feet, the corresponding contents being 338 million cubic feet. On the 8th June, the level of the water fell to 22·50 feet, the contents being 107 million cubic feet when replenishment commenced and the waste weir overflowed on the 29th June. The draw-off for irrigation purposes commenced on the 25th October with a depth of 47 feet, the contents then being 572 million cubic feet. On the 31st March, the level of water was 38 feet, the corresponding contents being 338 million cubic feet. The maximum flood occurred on the 12th September.

The following table gives the figures of area irrigated, revenue assessed, etc. during the year as compared with the average of the past three years :—

Name of Canal.	Area irrigated.		Water rates assessed.		Gross revenue assessed.	
	1934–35.	Average.	1934–35.	Average.	1934–35.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Palkhed Canal ..	2,168	1,901	17,200	15,824	38,155	35,568
Ojhar Tambat Canal ..	1,016	994	9,284	9,270		
Wadali Canal ..	910	935	8,325	8,669		

Name of Canal.	Working expenses.		Realisations.		Rainfall.	
	1934–35.	Average.	1934–35.	Average.	1934–35.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Palkhed Canal ..	32,639	30,517	18,944	30,506	20·63	39·31
Ojhar Tambat Canal ..					19·40	39·37
Wadali Canal ..					15·73	27·67

During the month of January 1935 some of the irrigated crops were damaged owing to the cold wave which occurred during that month and relief was given by the grant of remissions and suspensions according to the degree of damage caused. The cost of the measuring establishment employed was equivalent to 6 pies per acre as compared with the figure of 5 pies of the previous year. The refunds sanctioned during the year amounted to Rs. 23 and remissions to Rs. 12,074.

Parsul Tank.

This tank is formed by an earthen dam constructed across the Parsul river in the Malegaon taluka of the Nasik District. It depends solely on local rains for its supply. The storage capacity of the tank is 119 million cubic feet with a depth of 35 feet. There is no canal included in the system and the irrigation is effected by means of small channels taking off from the Parsul river itself downstream of the tank.

On the 1st April, the level of the water in the tank was 19·40 feet, the corresponding contents being 40·60 million cubic feet. The supply in the tank was exhausted on the 13th July and replenishment commenced on 2nd August. The water in the tank did not reach its full supply level this year, the highest level obtained being 19 feet on 13th September, the corresponding contents being 39 million cubic feet. The water supply in the tank was again exhausted on 31st December.

The following table gives the figures of area irrigated, revenue assessed etc. during the year as compared with the average of past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
285	701	2,414	3,655	2,722	9,077

Working expenses.		Realisations.		Rainfall.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
1,320	4,621	4,507	3,265	17·33	24·22

The cost of the measuring establishment employed was equivalent to 1 anna 5 pies per acre as compared with the figure of 1 anna 3 pies of the previous year. The remissions sanctioned during the year amounted to Rs. 93.

AHMEDNAGAR DIVISION.

PRAVARA RIVER WORKS.

This canal system, which was constructed at a cost of 1½ crores, comprises :—

(1) The Wilson Dam at Bhandardara on the Pravara river. This dam, which impounds the water of Lake Arthur Hill, is one of the highest dams in the world having a height of 282 feet. It is 1,600 feet in length and the lake formed by the dam has a storage capacity of some 12,092 million cubic feet ;

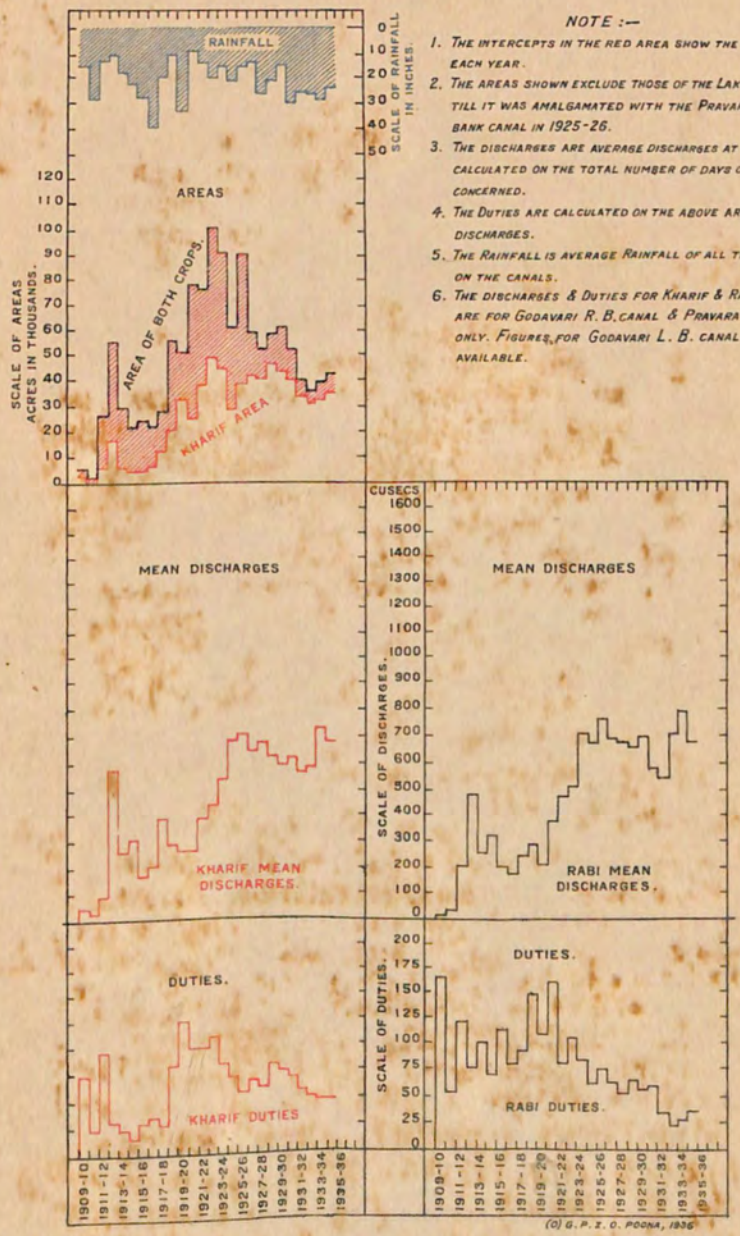
(2) A pick-up weir, 890 feet long situated at Ojhar 53 miles downstream from Lake Arthur Hill and about 8 miles east of Sangamner ; and

(3) Two canals, the Pravara Right Bank Canal, 33 miles in length and the Pravara Left Bank Canal, 48 miles long, which take off from the river at the Ojhar weir.

These canals irrigate lands in the Ahmednagar District and command an area of 228,720 acres. The designed discharges of the two canals (Pravara Right and Left Bank canals) at head are 152 and 530 cusecs, respectively, the corresponding full supply depths being 5 feet and 8 feet. Both canals have silted considerably and at present they can only carry 110 cusecs and 370 cusecs, respectively. The silting in the Pravara Right Bank Canal is confined chiefly to the first mile of the canal and as there is sufficient " head " available the discharge of the canal can be increased by raising the banks when required. The Pravara Left Bank Canal is infested with weeds. Proposals for the remodelling of the first few miles of the Pravara Left Bank Canal are under consideration. The construction of the Wilson Dam was commenced in 1911 and completed in 1926. The catchment area of the lake is 47 square miles in extent ; it is situated in the ghats and has an assured run-off. The dam is designed to impound a maximum depth of water of 270 feet and is constructed across a gorge in the valley of the Pravara river. At present water is impounded to a depth of 260 feet giving a storage of 10,086 million cubic feet and this could be increased to 12,092 million cubic feet with a corresponding depth of 270 feet by the erection of automatic gates on the waste-weir or by the construction of siphon spill ways and the raising of the waste-weir. Silt has accumulated in the pick-up weir at Ojhar and a proposal to raise the waste weir by 2 feet is under consideration.

On 1st April, the level of water in the lake was 177·60 feet, the corresponding contents being 5,528·78 million cubic feet. The lowest level of 130·95 feet was reached on 27th June, the contents being 2,125·80 million cubic feet. Replenishment commenced with effect from 27th June and the full supply level of 260 feet was reached on 24th July, the contents then being 10,086·23 million cubic feet. The maximum flood occurred on 5th August when the level of water was 213·70 feet and this lasted for about 12 hours. The full supply level was maintained till 9th October and the draw-off for irrigation purposes commenced on this date

AHMEDNAGAR DIVISION
GODAVARI & PRAVARA CANALS
COMBINED WORKING RECORD.
FOR THE YEAR 1934 - 35.



NOTE :-

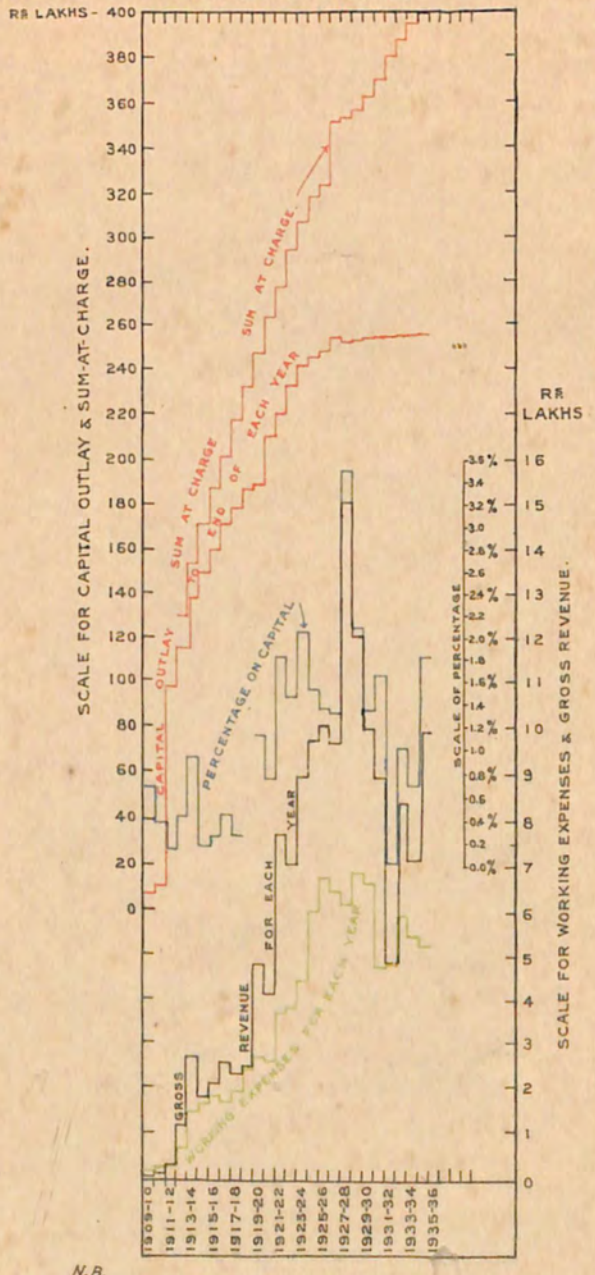
1. The intercepts in the red area show the Rabi areas each year.
2. The areas shown exclude those of the Lakh channel till it was amalgamated with the Pravara left bank canal in 1925-26.
3. The discharges are average discharges at head calculated on the total number of days of the season concerned.
4. The Duties are calculated on the above areas and discharges.
5. The Rainfall is average Rainfall of all the stations on the canals.
6. The discharges & Duties for Kharif & Rabi 1912-13 are for Godavari R. B. canal & Pravara canals only. Figures for Godavari L. B. canal are not available.

(c) G. P. I. O. POONA, 1936

16-11

Executive Engineer,
Ahmednagar Division.

AHMEDNAGAR DIVISION
GODAVARI & PRAVARA CANALS
COMBINED FINANCIAL RECORD.
FOR THE YEAR 1934-35



N.B.

THE INTERCEPT BETWEEN THE TWO RED LINES SHOWS ARREARS OF INTEREST UNPAID UPTO END OF EACH YEAR, WHICH BEING ADDED TO THE CAPITAL GIVE SUM AT CHARGE.

THE INTERCEPT BETWEEN THE GREEN & BLACK LINES SHOWS THE NET INCOME EACH YEAR.

NAME OF CANAL	CONSTRUCTION COMMENCED IN.	CANAL WAS OPENED IN.
GODAVARI CANALS.	1907	1911-12
PRAVARA CANALS.	1909	1909-10

15-11

EXECUTIVE ENGINEER.
AHMEDNAGAR DIVISION

as compared with 1st November during the previous year. The level of water gradually fell to 176·65 feet on 31st March 1935, the contents then being 5,427·80 million cubic feet. The yield from the catchment (47 square miles in extent) of the lake was 36,792·19 million cubic feet, while the average rainfall recorded at the several rain gauge stations situated in the area was 163·56 inches. The rainfall both in the catchment and in the canal tracts was sufficient, timely and well distributed. Owing to the satisfactory rains, which were received in August and September, and the late rains which occurred in November there was a reduced demand during the year for canal water for rabi irrigation.

The following table gives the figures of areas irrigated, revenue assessed etc., during the year as compared with the average of the past three years :—

Name of work.	Area irrigated.		Water rates assessed.		Gross assessed revenue.	
	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Pravara Right Bank Canal..	5,519	5,435	73,268	72,468	4,44,553	3,78,629
Pravara Left Bank Canal ..	21,075	16,806	3,61,568	2,94,506		

Name of work.	Working expenses.		Realisations.		Rainfall.	
	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Pravara Right Bank Canal..	2,29,009	2,39,323	6,57,189	3,59,250	27·7	27·38
Pravara Left Bank Canal ..					22·88	25·80

The total area of sugarcane blocks was 8,034 acres while the area under two-seasonal blocks was 914 acres. Heavy frost occurred during the period 14th to 16th January 1935 and this caused damage to the irrigated crops and on this account relief was given by means of remissions and suspensions of irrigation dues. The remissions sanctioned during the year amounted to Rs. 17,552. The cost of the measuring establishment employed was equivalent to 6 pies per acre as compared with the figure of 7 pies of the previous year. The expenditure incurred on maintenance and repairs to the Wilson Dam and the two canals amounted to Rs. 49,392 and that on maintaining the telegraph and telephone lines amounted to Rs. 10,037.

Bhatodi Tank.

This is a small tank situated on the Mehekari river about 12 miles from Ahmednagar. It depends entirely on local rains for its supply. Due to silting the storage capacity of the tank has been reduced from 154 million cubic feet to about 39 million cubic feet.

On 1st April, the level of the water in the tank was 20·25 feet, the corresponding contents being 22·77 million cubic feet. The first replenishment was received on 10th June which raised the level of water to 18·70 feet. The highest level reached was 25 feet on 11th June when the waste-weir overflowed to a depth of 2·5 feet. The expenditure incurred on maintenance and repairs amounted to Rs. 971.

The following table gives the figures of areas irrigated, revenue assessed etc. during the year as compared with the average of the past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
598	674	3,134	3,155	4,556	6,043

Working expenses.		Realisations.		Rainfall.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
2,785	4,679	6,206	5,531	25·93	28·33

CENTRAL CIRCLE

POONA DIVISION

The area irrigated, the gross assessed revenue and the working expenses of the two works mentioned below, as compared with the average of the preceding three years, are given in the following statement :—

Name of work.	Area irrigated.		Gross assessed revenue.		Working expenses.	
	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Krishna Canal ..	3,846	4,815	60,220	83,029	21,377	22,124
Rewari Canal ..	457	722	3,173	4,160	3,844	3,989

Krishna Canal.

The total rainfall gauged at Retre Budruk, which is situated in the centre of the canal tract, was 26·81 inches, as compared with the average of 38·01 inches for the preceding three years. The rainfall was timely and well distributed over the catchment area.

Rewari Canal.

The rainfall gauged at Rewari, which is situated one mile below the bandhara, was 30·30 inches as compared with 37·49 inches, the average of the preceding three years. The rainfall was timely, sufficient and well distributed over the catchment area.

Sholapur Division.

The area irrigated, the gross assessed revenue and the working expenses of the tanks and canals now within the jurisdiction of the Sholapur Division, as compared with the average of the preceding three years, are given in the following statement :—

Name of work.	Area irrigated.		Gross assessed revenue.		Working expenses.	
	1934-35.	Average.	1934-35	Average.	1934-35.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Ekruk Tank ..	2,571	3,378	1,31,674	1,35,710	29,480	28,273
Koregaon Tank ..	482	524	2,474	2,589	2,043	2,300
Ashti Tank ..	1,834	3,298	11,232	17,653	12,399	25,526
Pathri Tank ..	474	923	10,810	12,746	3,835	4,436
Upper Man River Works.	460	1,176	2,628	5,013	6,269	7,458
Yerla River Irrigation Works ..	1,720	3,355	11,915	18,481	13,485	14,338
Chikhli Canal ..	239	238	2,619	2,235	1,517	1,795
Maini Tank ..	1,015	1,505	5,973	6,608	4,917	5,155

Ekruk Tank.

The Ekruk Tank, situated near Sholapur, which came into operation in the year 1872–1873, is an artificial reservoir formed by the construction of a large earthen embankment 7,000 feet long and having a maximum height of 76 feet. It supplies water to the mills in Sholapur, G.I.P. Railway, Sholapur Municipality, and to a restricted area of irrigation crops. Under unfavourable conditions of replenishment, which occur periodically, the supply available from the tank is not sufficient to meet all the demands which arise, and the question of augmenting the storage by the construction of an auxiliary reservoir or by the installation of a pumping plant on the river Sina is under investigation.

On 1st April, the level of the water in the tank was 35·09 feet above the level of the sill of the outlet. Owing to the fact that sufficient storage

therefor was obtained sugarcane irrigation was encouraged during the year under report. The storage available on 31st May being satisfactory, monsoon irrigation to the extent of 300 acres was also allowed. The waste weir of the tank began to flow in September owing to the satisfactory rains. The mean rainfall gauged at the five stations in the catchment area was 22·34 inches as compared with 21·43 inches, the average of the preceding three years. The total replenishment received in the tank amounted to 1,828·04 million cubic feet.

Koregaon Tank.

On 1st April, the level of the water in the tank was at 87·59, i.e. 7·59 feet, above the level of the sill of the outlet. This level gradually fell to 85·40 but owing to the occurrence of rain on 10th June, a replenishment of 4·14 million cubic feet was received and the tank overflowed with effect from 7th September to 12th October. During the year under report, the rainfall being sufficient, there was a very poor demand for canal water.

The rainfall gauged at Koregaon was 26·65 inches as compared with 26·12 inches, the average of the preceding three years.

Ashti Tank.

On 1st April, the level of the water in the tank was at 219·84, i.e. 10·07 feet above level of the sill of the outlet. This level gradually fell to 217·05 on 28th July. Thereafter owing to the occurrence of rains at regular intervals a replenishment of 108·87 million cubic feet was received and the level rose to 227·27 on 2nd November. During the year under report, sufficient rainfall was received in the area served by the tank and hence there was a poor demand for canal water both in the Kharif and Rabi seasons. The average rainfall gauged at the two stations was 25·45 inches as compared with 29·64 inches, the average of the preceding three years.

Pathri Tank.

On 1st April, the level of the water in the tank was at 237·25, i.e. 27·95 feet above the level of the sill of the outlet, and this level gradually fell to 234·88. As soon as the rains commenced the level began to rise and a replenishment of 10·155 million cubic feet was received during June. With further replenishment received during the months of July and August and due to the occurrence of heavy rain on 2nd August, the level of the water in the tank rose to 242·50. The waste weir overflowed during the period 15th August to 7th October, and again during the period 2nd November to 10th November. The storage was utilised in meeting the demands both of lease-holders and ordinary irrigators and of the Barsi Municipality.

The average rainfall gauged at two stations situated in the catchment area was 31·62 inches as compared with 28·84 inches, the average of the preceding three years.

Upper Man River Works.

(Pingli Tank.)

On 1st April, the level of the water in the tank was at R.L. 2,361·06 equivalent to a storage of 39·70 million cubic feet. The first replenishment was received on 14th May, when the water level rose from R.L. 2,357·94 to R.L. 2,358·64. The second replenishment was received on 7th June, followed by another on the 10th idem. The water level which had risen as a result of this then began to subside until 26th July, when frequent replenishments were received and the water level continued to rise until 2nd November. The water level reached a peak = R.L. of 2,371·76 corresponding to a storage of 165·22 million cubic feet, and at this level the waste weir overflowed to a depth of 0·65 feet.

The rainfall gauged at Gondavla, which is situated 3 miles below the site of the tank, was 25·04 inches as compared with 22·34 inches, the average of the preceding three years.

Yerla River Irrigation Works.

(Nehr Tank.)

On 1st April, the R.L. of the water in the tank was 2,660·99, the corresponding contents being 275·66 million cubic feet. The supply was utilised for hot weather irrigation. The first replenishment was received on 10th June, when the R.L. of the water rose from 2,657·72 to 2,659·40. The second replenishment was received on 6th July, when the water level which had fallen to R.L. 2,658·98 again rose to R.L. 2,659·82. The water level then remained more or less steady till 26th July, and then began to rise on account of the subsequent replenishment received. The full supply level, viz. R.L. 2,660·02, was reached on 13th October, and the H.F.L. occurred on 2nd November, when a depth of overflow of 0·58 feet was recorded over the waste weir. The rainfall gauged at Khatgaon which is situated about 4 miles below the site of the tank was 27·13 inches as compared with 39·72 inches, the average of the preceding three years.

Chikhli Canal.

On 1st April, the river flowed at a level 2·80 feet above the level of the weir. The first flood occurred on 14th May, and the second on 8th June, while the highest flood received during the year occurred on 1st November. The rainfall gauged at Chikhli was 22·70 inches as compared with 30·86 inches, the average of the preceding three years.

Maini Tank.

On 1st April, the water level in the tank was at R.L. 2,298·82 giving a storage of 8·34 million cubic feet. The tank was dry during the period 28th April to 12th May when the first replenishment was received and storage to a reduced level of 2,301·92, equivalent to 36·68 million cubic feet, was impounded. This replenishment was followed immediately by further replenishment received on 15th May, which resulted in a rise in the level of the water to R.L. 2,304·82 equivalent to a storage of 41·64 million cubic

feet. The storage was utilised for the irrigation of kharif crops. The tank reached the F.S.L., viz. R.L. 2,304·52, on 2nd August, and the waste weir overflowed intermittently thereafter until 22nd December. The rainfall gauged at Maini was 21·41 inches as compared with 26·0 inches, the average of the preceding three years.

KHANDESH DIVISION.

JAMDA CANALS.

These canals receive their supply from the Girna river and this supply is supplemented from time to time by water obtained from Chankapur Tank situated in the Nasik Irrigation Division. During the year under report, water could not be spared from this tank although such supplementary supply was required. The rainfall in the canal area was 27·61 inches as compared with 32·56 inches, the average of the past three years. The sub-joined table shows the area irrigated, the gross assessed revenue and the working expenses, as compared with the average of the preceding three years :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,948	2,306	13,777	14,273	16,667	13,167

HARTALA TANK.

The tank derives its supply solely from local rains and this supply is precarious. On 1st April, the storage impounded in the tank was 84·24 million cubic feet and this gradually diminished to 52·56 million cubic feet. On 25th June the first replenishment was received and the contents of the tank increased to 52·77 million cubic feet. The maximum storage of 132·95 million cubic feet was reached on 9th September, while on 31st March the storage was 89·34 million cubic feet. The rainfall gauged at the tank was 38·68 inches.

The sub-joined table shows the area irrigated, the gross assessed revenue and the working expenses, as compared with the average of the preceding three years :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
41	80	680	722	1,192	819

Mhaswa Tank.

The tank derives its supply from local rains. On 1st April, the storage of the tank amounted to 61·85 million cubic feet which gradually diminished to 33·44 million cubic feet. The first replenishment was received on 10th June and the contents of the tank increased to 35·64 million cubic feet. The maximum storage of 182·75 million cubic feet was reached on 8th September, when the tank overflowed. The year closed with a storage of 105·10 million cubic feet on 31st March 1935. The rainfall gauged at the tank was 34·50 inches as compared with 32·54 inches, the average of the preceding three years.

The area irrigated, the gross assessed revenue and the working expenses, as compared with the average of the preceding three years are given below :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
34	305	872	1,715	1,879	1,596

Shahada Channel.

The channel is fed by the Gomai river which has a perennial flow. The rainfall gauged at Shahada was 20·61 inches as compared with 34·85 inches, the average of the preceding three years. The supply received was adequate throughout the year. The area irrigated, the gross assessed revenue and the working expenses, as compared with the average of the preceding three years are given below :—

Area irrigated.				Gross assessed revenue.		Working expenses.	
Patasthal.		Jirayat.					
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,005	996	388	341	9,515	8,197	7,380	6,217

Lower Panjhra River Works.

These works comprise 8 bandharas and 9 channels situated between Dhulia and Betawad on the Panjhra River and the Mukti Tank, which is situated about 4 miles to the South-West of Dhulia. The channels obtain their supply from the river but when that supply is insufficient, it is supplemented by water obtained from the Mukti Tank. On 1st April,

the contents of the tank were 158·50 million cubic feet and this figure gradually diminished to 74·90 million cubic feet. The first replenishment was received on 23rd July and this raised the contents of the tank to 84·67 million cubic feet. The maximum storage of 211·78 million cubic feet was reached on 21st September.

The sub-joined table shows the area irrigated, the gross assessed revenue, and the working expenses, as compared with the average of the preceding three years :—

Area irrigated.				Gross assessed revenue.		Working expenses.	
Patasthal.		Jirayat.					
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,267	1,261	1,267	1,221	26,359	26,228	5,281	8,116

SOUTHERN CIRCLE.

BELGAUM DIVISION.

Gadikeri Tank.

The lands under the command of this tank are all assessed at consolidated rates. The area irrigated and the irrigation share of the land revenue assessed were 418 acres and Rs. 2,344 respectively. The working expenses amounted to Rs. 551.

Gokak Canal.

This canal system is the most important irrigation scheme in the Southern Circle and consists of a reservoir formed by a masonry weir constructed across the Ghataprabha river at Dhupdal, in the Belgaum District, together with 16 miles of main and branch canals and 36 miles of distributaries. The canal commands an area of 18,668 acres, the area irrigable being 17,627 acres. Although the Dhupdal Storage is mainly intended for the irrigation of the lands under the canal, a stipulated quantity of water is issued to the Gokak Mills Company in accordance with the terms of an agreement reached between Government and the Company, in consideration of which a sum of Rs. 14,313 is annually paid by the Company subject to a rebate in the event of the supply falling short of the quantity contracted for. During the year under report, the Mills were supplied with the full stipulated quantity of water.

Water was supplied to the Madras and Southern Mahratta Railway Company at their Hukeri Road Station at a charge of Rs. 50 per mensem. The total amount recovered from the Railway Company on this account during the year was Rs. 600.

On the 1st April, the gauge reading of the water level in the Dhupdal Reservoir was 21·73 feet. The level gradually decreased to 16·76 feet on 12th May. Owing to replenishment received on the 13th May the level rose to 18 feet. The rise continued up to 16th May when the gauge reading was 19·10 feet. During the whole monsoon, the highest overflow occurred on the 13th August when the gauge reading averaged 25·05 feet, i.e., 2·75 feet above the level of the sill plank of the temporary crest and 2·99 feet above the level of the permanent crest of the overflow weir. The maximum daily discharge was 54,137·96 cusecs. In order to store the water of the post monsoon floods, the first instalment of the work of the temporary raising of the weir by 2 feet was commenced on 28th September and completed on 10th October, and the work of the second instalment was started on 11th October and finished on 25th of the same month. The water level reached a maximum of 25·78 feet on 17th December, i.e., 0·28 feet below F.S.L. The reduction in the F.S.L. obtained was due to the failure of the late rains.

The following table gives information regarding the area irrigated, revenue assessed etc., as compared with the average of the previous three years :—

	Area irrigated.	Gross assessed revenue.	Working expenses.
	Acres.	Rs.	Rs.
Average	6,405	61,231	19,291
1934-35	6,901	57,422	13,778

DHARWAR DIVISION.

Muchkundi Tank.

This tank is solely dependent on local rains for its supplies and the storage of water in the tank is uncertain owing to the scanty rainfall in the area and the smallness of the catchment. The rainfall received during the year although less than that of the previous year was favourable and the supply of water was sufficient for the irrigation of all the lands dependent on the tank. On the 1st April, the water level in the tank was at R.L. 1,796·10 or 12·66 feet above the sill of the outlet. The tank received its first replenishment on the 13th October and the water level reached R.L. 1,794·65 on the 31st October. The level was at R.L. 1,790·62, or 7·18 feet above the sill level on 31st March 1935. The gross assessed revenue was Rs. 951, while the working expenses amounted to Rs. 1,820.

Dambal Tank.

On the 1st April, the level of the water in the tank was at R.L. 143·30, or 7·10 feet above the level of the silted bed of the tank. The tank did

not receive any replenishment until November on account of the scanty rainfall received. The tank received its first replenishment on 1st November and its second on 31st January, the water level then being R.L. 140·50 or 4·30 feet and R.L. 139·00 or 2·80 feet, respectively, above the silted bed of the tank. Part of the land dependent on this tank is assessed at water rates, the balance being assessed at consolidated rates. The total area irrigated and the assessment levied under the former head (water rates) were, respectively, 19 acres and Rs. 129 compared with 46 acres and Rs. 177, the corresponding averages of the past three years. The irrigated area under consolidated assessment and the irrigation share of the land revenue assessed were 143 acres and Rs. 916 respectively. The total assessed revenue was Rs. 2,821, while the working expenses amounted to Rs. 6,725.

On account of the scarcity conditions prevailing in the Mundargi Petha of the Dharwar District the work of the construction of a feed channel from Kadampur North and South Nallas to Dambal Tank estimated to cost Rs. 35,160 was undertaken and the work is in progress.

Medleri Tank.

On the 1st April, the gauge reading of water level of the tank was 169·65 feet or 4·65 feet above the sill level of the outlet. The tank received its first replenishment on 16th May and the highest level reached during the year was 180·40, or 0·40 feet above the crest level of the waste weir. A sufficient supply of water was obtained in the tank during the year. The area irrigated and the assessment levied thereon were 45 acres and Rs. 506, respectively, as compared with 37 acres and Rs. 481, respectively, the averages of the past three years. The gross assessed revenue was Rs. 743 and the working expenses amounted to Rs. 1,929.

Madag Tank.

On the 1st April, the water level of the tank was at R.L. 1,877·05, or 3·79 feet above the sill of the outlet. The tank received its first replenishment on the 8th April and overflowed during the period 27th June to 5th January. The highest water level reached during the year was R.L. 1,884, or 6·29 feet above the level of the crest of the waste weir. The supply of water in the tank throughout the year was sufficient for irrigational purposes. The level of the water in the tank on 31st March 1935 was R.L. 1,874·45, or 1·19 feet above the level of the sill of the outlet. The area irrigated and the assessment levied thereon were 640 acres and Rs. 3,292, respectively, as compared with 495 acres and Rs. 2,292, respectively, the corresponding averages of the past three years. The gross assessed revenue amounted to Rs. 3,649 as compared with Rs. 2,561, the average of the previous three years, while the working expenses amcunted to Rs. 1,568 as compared with Rs. 1,997, the average of the past three years.

ASUNDI TANK.

On 1st April, the level of the water in the tank was at R. L. 103·62 or 2·12 feet above the level of the silted bed of the tank. With the exception of a small replenishment received on 17th May, the tank was practically dry until the 4th June. It received its second replenishment on the 5th June and the highest water level reached was R. L. 106·40 on 14th October. Due to the scanty rainfall received the tank was empty for about a month and therefore the chilli crop did not mature fully as usual. The lands under this tank are assessed partly at water rates and partly at consolidated rates. The area irrigated and the assessment levied thereon under the former head (water rates) was 187 acres and Rs. 1,263, respectively, as compared with 130 acres and Rs. 894, respectively the corresponding averages of the past three years. The area under consolidated assessment was 190 acres and the irrigation share of the land revenue assessed thereon was Rs. 686. The gross assessed revenue amounted to Rs. 2,059 as compared with Rs. 1,888, the average of the previous three years. The working expenses amounted to Rs. 1,022.

DHARMA CANAL.

This Canal is fed by the Dharma River, and a number of tanks are fed by the Canal. The Canal began to flow on 7th July and continued to flow during the whole of the monsoon. The rainfall received during the year was moderate in quantity. All the second class tanks dependent on this canal received satisfactory replenishment. An amount of Rs. 600 was spent on the work of 'Raising the bank of Dharma Canal' and a sum of Rs. 410 was spent in repairing eight regulators (mainly in providing teak wood plank shutters for the regulators). The lands commanded by this canal are assessed partly at water rates and partly at consolidated rates. The irrigated area and the assessment levied thereon under the former head (water rates) were 482 acres and Rs. 2,701 respectively as compared with 431 acres and Rs. 2,449 respectively, the corresponding averages for the past three years. The gross assessed revenue (after the deduction of a sum of Rs. 23,156, which was required to be credited to old work) amounted to Rs. 309 while the working expenses amounted to Rs. 3,230 as compared with Rs. 2,670, the average of the previous three years.

KANARA DIVISION.

MAVINKOP TANK.

The management of this tank has been entrusted to the Revenue Department. The rainfall received amounted to 49·93 inches and the supply of water in the tank was adequate for irrigational purposes.

The area irrigated under this tank, which is assessed at consolidated rates, amounted during the year to 660 acres and the irrigation share of the land revenue amounted to Rs. 2,045 as compared with 116 acres and Rs. 1,850, respectively, for the previous year. The working expenses amounted to Rs. 419 as compared with Rs. 479 during the previous year. The gross assessed revenue was Rs. 2,045.

SECTION II.

COMPRISING IRRIGATION WORKS FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUNTS ARE KEPT.

GENERAL REMARKS.

The area of irrigation under, and the revenue due from, works (for which neither Capital nor Revenue Accounts are kept) in the Deccan and Gujarat, as recorded in the register of these works, were 284,302 acres and Rs. 9,23,900, respectively. The following tables give details (by Districts) of the area irrigated, expenditure incurred, revenue realised etc., in respect of those irrigation works on which expenditure was incurred during the year :—

TABLE I.

Showing the area irrigated in the different Districts in the Deccan and Gujarat and the consolidated revenue and water rates assessed and recovered during the year 1934-35 in respect of Irrigation Works classed under "Works for which neither capital nor revenue accounts are kept" on which expenditure has been incurred during the year.

Collectorate.	Number of works.	Area irrigated.	Revenue.			Remarks.
			Irrigation share.	Land share.	Total.	
		Acres.	Rs.	Rs.	Rs.	
Ahmedabad ..	46	3,306	(A) 4,612	7,958	12,570	(A) Includes Rs. 77 on account of Direct Receipts, Water rates.
Kaira ..	23	8,047	(B) 18,693	20,501	39,194	(B) Includes Rs. 9,033 on account of Direct Receipts, Water rates.
Panch Mahals ..	16	1,614	(C) 6,463	1,436	7,899	(C) Includes Rs. 5,774 on account of Direct Receipts, Water rates.
Surat ..	26	1,488	3,467	12,866	16,333	
Broach ..	4	133	225	809	1,034	
East Khandesh ..	1	130	1,043	411	1,454	
West Khandesh	4	728	(D) 3,689	661	4,350	(D) Includes Rs. 568 on account of Direct Receipts, Water rates.
Nasik ..	63	6,461	(E) 51,214	11,299	62,513	(E) Includes Rs. 3,109 on account of Direct Receipts, Water rates.
Poona ..	1	118	(F) 446	..	446	(F) Water rates Direct Receipts.
Sholapur ..	3	268	(G) 1,649	..	1,649	(G) Water rates Direct Receipts.
Ahmednagar ..	2	1,498	(H) 8,951	..	8,951	(H) Water rates Direct Receipts.
Belgaum ..	24	1,401	5,886	1,472	7,358	
Dharwar ..	85	10,119	37,363	9,340	46,703	
Bijapur ..	2	248	1,059	418	1,477	
Kanara ..	39	3,900	10,228	2,529	12,757	
Ratnagiri ..	2	164	1,645	..	1,645	
Total ..	341	39,623	1,56,633	69,700	2,26,333	

TABLE II

TABLE

Showing actual expenditure and receipts for the year 1934-35 on the revenue accounts are kept) on which

Collectorate.	Expenditure.						
	Direct Charges.						
	Extensions and improvements.	Maintenance and repairs.	Establishment.	Tools and plant.	Total.	Share of collection charges.	Grand Total.
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ahmedabad ..	3,169	14,900				461	
Kaira	600	14,044	16,455	555	63,536	1,884	66,397
Panch Mahals ..	..	13,813				516	
Surat	..	18,374				347	
			6,571	222	25,372		25,742
Broach	..	205				23	
East Khandesh ..	78	..				104	
West Khandesh ..	604	508	1,312	25	2,527	323	2,954
Nasik	1,553	45,546	50,838	711	98,648	4,872	1,03,520
Poona	694	13,887	38,965	220	53,766	9	53,775
Sholapur ..	92	1,825	2,209	40	4,166	44	4,210
Ahmednagar ..	Works 6,934; Extension and Improvements 0	15,602	32,120	342	55,088	175	55,263
Belgaum	990	12,401	5,938	244	19,573	598	20,171
Dharwar ..	2,663	33,891	16,365	651	54,177	3,747	58,030
Bijapur	..	607				106	
Kanara	2,455	15,431	7,930	326	26,142	1,023	27,165
Ratnagiri ..	25	4 935	2,197	90	7,247	165	7,412
Total ..	Works 6,934; Extensions and Improvements 13,013	2,05,969	1,80,900	3,426	4,10,242	14,397	4,24,639

II.

Irrigation Works in the Deccan and Gujarat (for which neither capital nor expenditure was incurred during the year.

Actual Receipts.						
Direct Receipts.			Indirect receipts share of consolidated revenue.	Grand total, direct and indirect receipts.	Less refunds of revenue.	Gross receipts less refunds.
Water rates from irrigation.	Miscellaneous.	Total direct receipts.				
9	10	11	12	13	14	15
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
77	636	713	4,535	5,248	....	5,248
9,033	6,333	15,366	9,660	25,026	....	25,026
5,774	2,942	8,716	689	9,405	....	9,405
..	..	..	3,467	3,467	....	3,467
..	..	..	225	225	....	225
..	..	..	1,043	1,043	....	1,043
568	207	775	3,121	3,896	....	3,896
3,109	1,187	4,296	48,105	52,401	....	52,401
446	241	687	....	687	....	687
1,649	940	2,589	....	2,589	....	2,589
8,951	3,397	12,348	....	12,348	12	12,336
....	95	95	5,886	5,981	....	5,981
....	133	133	37,363	37,496	....	37,496
....	..	....	1,059	1,059	....	1,059
....	..	....	10,228	10,228	....	10,228
....	..	....	1,645	1,645	....	1,645
29,607	16,111	45,718	1,27,026	1,72,744	12	1,72,732

DETAILED REPORTS BY LOCAL OFFICERS.

NORTHERN CIRCLE.

AHMEDABAD, KAIRA AND PANCH MAHALS AND SURAT AND BROACH DIVISIONS.

KHARI SLUICES.

On account of the satisfactory rainfall received in its catchment, the Khari river rose in flood on several occasions during the course of the monsoon. Water was not, however, drawn into the Khari Cut Canal but was allowed to pass below the Raipur Weir for the purpose of serving the needs of irrigation conducted under the Khari Sluices throughout the year. As a result of the early floods of the river, the Bherai and Naika reservoirs and other 2nd class tanks under the system were filled to their full capacity. No difficulty was therefore experienced in supplying water by rotation to the Kalambandhi villages for the purpose of transplanting the full area assessed to himayat.

The Himayat paying area aggregates 7,006 acres situated in 11 Kalambandhi villages, and of this total acreage 6,400 acres were cropped with rice and brought to maturity. In addition to this area a non-himayat paying area of 652 acres was irrigated and the crops thereon brought to maturity. Due to the steady flow in the river the rabi crops raised were satisfactory. During the period covered by the hot weather Juwar crops were grown in some Kalambandhi villages by the early watering received from the flow of the Khari river but in the latter part of the season the river ceased to flow and the crops began to wither. These crops were, however, protected by means of water drawn from the Bokh reservoir.

The Khari Sluices, including the Goblaj Tank, the Bherai and the Naika Reservoirs were maintained in good order at a cost of Rs. 4,499. A sum of Rs. 800 was also spent in closing the breaches formed in the training bund of the waste channel of the Goblaj Tank and a sum of Rs. 500 was spent in carrying out special repairs to the Bherai Reservoir. The miscellaneous revenue under the Khari Sluices system amounted to Rs. 403 compared with the amount of Rs. 641 received during the previous year.

The following table compares the areas irrigated and the assessment levied during the year with the respective averages of the previous three years :—

	Average		1934-35.	
	Area.	Revenue after deducting Remissions.*	Area.	Revenue after deducting Remissions.*
	Acres.	Rs.	Acres.	Rs.
I. Irrigation above the Kalambandhi villages (of Mahij, Bidaj and Lali).	746	4,604	1,550	11,368
II. Irrigation from tanks fed by the river Khari :—				
Goblaj	703	5,689	955	4,294
Galki	319	1,305	704	1,136
III. Irrigation from the Khari Sluices proper (i.e., 11 Kalambandhi villages)	6,416	32,948	6,400	27,416
Total ..	8,184	44,546	9,609	44,214

*The revenue is consolidated.

The assessment in respect of irrigation dependent on the Khari Sluices in the Kalambandhi villages is consolidated. The average rates per acre levied for land and water, respectively, were as under :—

	Irrigation share.	Land share.	Total consolidated.
	Rs. a p.	Rs. a. p.	Rs. a. p.
Government land	0 5 0	4 6 9	4 11 9
Alienated land	0 5 4	1 7 4	1 12 8

Muwalia Tank.

This is an important tank situated in the vicinity of Dohad town in the Broach and Panch Mahals Collectorate and it has a catchment area of about 30 square miles located in a hilly tract. It did not fill to its F. S. L. during the year under review owing to the inadequate rainfall received. Special repairs to the water cushions of the clear overfall waste weir of this tank damaged during the floods of 1933-34 were carried out at a total cost of Rs. 3,962. Special repairs to the low level causeway across the Sukna Nalla on the Muwalia service road in mile 0/8 damaged by floods were also carried out during the year at a cost of Rs. 692. The total area irrigated during the year was 808 acres and the assessment thereon amounted to Rs. 2,762. The miscellaneous revenue realised amounted to Rs. 524 against the amount of Rs. 275 received in the previous year. The tank and its dam, canals, distributaries and service road were maintained in good order at a total cost of Rs. 4,499.

Old Tanks.

Improvements to 1 tank situated in the Ahmedabad Division and repairs to 32 tanks situated in the Ahmedabad Division, 25 tanks in the Kaira and Panch Mahals Division and 30 tanks in the Surat and Broach Division were carried out at a total cost of Rs. 250 and Rs. 47,381 respectively. The areas irrigated and the revenue derived from the old irrigation tanks and bunds were as under :—

Name of Collectorate.	Area irrigated.	Revenue.		
		Irrigation share.	Land share.	Total consolidated assessment.
	Acres.	Rs.	Rs.	Rs.
Ahmedabad	14,003	20,149	47,179	67,328
Kaira	353	1,350	483	1,833
Panch Mahals	270	689	1,436	2,125
Broach	823	1,481	5,015	6,496
Surat	1,375	2,443	12,441	14,884
Total ..	16,824	26,112	16,554	92,666

The drainage channels included in the Ahmedabad, Kaira and Panch Mahals and Surat and Broach Divisions were maintained in good order at a cost of Rs. 7,547, Rs. 3,837 and Rs. 4,677, respectively. The protective and reclamation works situated in the Surat and Broach Division were maintained and repaired at a total cost of Rs. 8,521.

DECCAN IRRIGATION CIRCLE.

POONA IRRIGATION DIVISION.

Rakh Tank.

This tank is situated about 5 miles from Walha railway station on the Madras and Southern Mahratta Railway and is formed by an earthen dam constructed across a nala near Rakh village in Purandhar Taluka of the Poona District. The tank has two channels of a total length of $3\frac{5}{8}$ miles. The area under command on channel No. 1, which is on the left bank, is 265 acres and that on channel No. 2 is 321 acres. There was no irrigation on the tank during the year under report. An area of 43 acres was, however, irrigated by percolation channels and the revenue realised therefrom amounted to Rs. 398 as compared with the corresponding figures of 90 acres and Rs. 580 of the previous year. The maintenance and repairs charges to Rakh Tank and channels during the year amounted to Rs. 598.

KHAMGAON TANK.

This tank, which is only partially completed, received replenishment during the monsoon from the Mutha Right Bank Canal. The supply available was issued for the irrigation of 118 acres and the gross revenue assessed thereon was Rs. 617 as compared with 85 acres and Rs. 426, respectively, during the previous year. The maintenance and repairs charges of the tank amounted to Rs. 369.

EFFLUENT IRRIGATION ON THE MUTHA RIGHT BANK CANAL.

The total area of sugar cane irrigated on effluent during the year was 873 acres as compared with 1,063 acres during the previous year. The average discharge pumped during the year was 9·15 cusecs out of which 8·35 cusecs were utilised for purposes of irrigation and the balance of 0·80 cusecs was run off to the winter disposal area. The total area irrigated was 1,143 acres as compared with 1,459 acres during the previous year. The revenue assessed amounted to Rs. 40,124 as compared with the sum of Rs. 54,317 assessed during the previous year. The rate for the supply of effluent for sugarcane was reduced from Rs. 55 to Rs. 52 during the year under report.

BANDHARAS.

The following table shows the area irrigated and the consolidated assessed revenue on the bandhara irrigation works in the Poona collectorate during the year as compared with the average of the past three years :—

Particulars.	Area irrigated.	Consolidated revenue.		
		Irrigation share.	Land share.	Total.
	Acres.	Rs.	Rs.	Rs.
1934-35	2,707	14,323	4,883	19,206
Average	2,733	14,320	4,885	19,205

Remissions amounting to Rs. 207-13-0 were sanctioned during the year.

NASIK IRRIGATION DIVISION

KHIRDI SATHE TANK.

This is a small tank situated in the Yeola Taluka of the Nasik District. The tank is formed by an earthen dam and is dependent on local rains for its supply which is generally sufficient for crops grown during the monsoon and rabi seasons.

On 1st April, the height of the water in the tank above the sill level was 12·50 feet, the corresponding contents being 34 millions cubic feet. The

area irrigated during the year was 652 acres as compared with 494 acres during the previous year. The assessed revenue amounted to Rs. 5,327 as compared with the sum of Rs. 5,178 assessed during the previous year.

BANDHARAS.

There are numerous bandharas situated in this Division. Bandharas are small weirs built across streams in order that the level of the water flowing in the streams may be raised sufficiently to command the lands to be irrigated. There are 299 such works in the Nasik District. The expenditure incurred on repairs to bandharas (70 in number) during the year amounted to Rs. 54,217 as compared with Rs. 28,678 during the previous year.

The following table gives the figures of area irrigated and revenue assessed during the year as compared with the average of the past three years :—

Particulars.	Area irrigated.	Consolidated revenue.		
		Irrigation share.	Land share.	Total.
	Acres.	Rs.	Rs.	Rs.
1934-35 ..	28,179	2,16,772	61,106	2,77,878
Average ..	28,652	2,04,366	54,968	2,59,335

AHMEDNAGAR DIVISION.

VISAPUR TANK.

The Visapur Tank dam, which is situated about 2 miles from the Visapur railway station on the Dhond-Manmad line, is built across the Hanga river a tributary of the Bhima river. It was started as a famine relief work in 1896 and was subsequently completed in successive stages by criminal tribes and convict labour by June 1927. This earthern dam, which is 7,440 feet long and 84 feet high, forms a lake having a net capacity of 1,136 million cubic feet. The estimated cost of the whole scheme was Rs. 41 lakhs of which a sum of Rs. 21 lakhs was spent on the dam and head works and the balance on the construction of the canal distributaries and minors which aggregate 46 miles in length. The total area under command is 95,000 acres of which 26,000 acres are irrigable. The catchment area of the tank is 159 square miles in extent and has a capacity of 1,172 million cubic feet. The waste weir was raised by 2 feet in March in order to increase the storage in the tank by 130·20 million cubic feet from 1,136 million cubic feet to 1,266·20 million cubic feet. Irrigation from this tank was first started during the rabi season of 1929-30. The yield from the catchment was 683·88 million cubic feet during the year, the average rainfall being 19·07 inches.

On 1st April, the level of the water in the tank was 35 feet above the sill level of the outlet, the contents being 938·70 million cubic feet. The lowest level of 31·30 feet was reached on 9th June, the corresponding contents then being 753·70 million cubic feet. Replenishment was received on 10th June, the corresponding contents being 820·67 million cubic feet. The highest water level reached during the year was 37·35 feet on 12th November, the corresponding contents being 1069·66 million cubic feet. On 31st March the level of water was 32·20 feet, the corresponding contents being 796·38 million cubic feet.

The area irrigated during the year, the irrigation assessment and the gross assessed revenue were 1,498 acres, Rs. 16,112 and Rs. 19,465, respectively, as compared with 2,381 acres, Rs. 10,135 and Rs. 13,883, respectively, the average of the past three years. The expenditure incurred on maintenance and repairs to the tank amounted to Rs. 7,403 during the year.

Kuntephal Tank.

This is a very small tank with a capacity of about 57 million cubic feet. The full supply level of the tank is 15 feet. It is situated on a small nalla about 45 miles from Ahmednagar. It is entirely dependent on local rains for its supply of water.

On 1st April the level of the water was 8·80 feet above the level of the sill, the contents then being 16·57 million cubic feet. The lowest level of 3·95 feet was reached on 6th June, the contents being 3·10 million cubic feet. Replenishment was received on 7th June, which raised the level to 6·20 feet, the corresponding contents being 7·54 million cubic feet. The highest water level of 16·20 feet was reached on 2nd August. The rainfall recorded was 34·50 inches as compared with 27·37 inches, the average of the past three years. The expenditure incurred on maintenance and repairs to the tank amounted to Rs. 1,161 during the year.

Central Circle.

The area irrigated and the gross assessed revenue on small tanks were 471 acres and Rs. 2,554, respectively. The area irrigated and the irrigation share of revenue on the old bandharas and channels situated in the Khandesh Division were 8,636 acres and Rs. 65,011, respectively.

SHOLAPUR DIVISION.

Wadshivne Tank.

On 1st April, the level of water in the tank was at 450·96, i.e., 14·96 feet above the level of the sill of the outlet, and this level gradually fell to 447·63 on 26th July but owing to the rainfall subsequently received the level began to rise after that date. With further replenishments received during the period July, August, September and October, and due to the occurrence of heavy rainfall in the catchment area on 2nd November, the waste weir overflowed during the period 2nd November to 25th November.

During the year under report, the area irrigated was 268 acres as compared with 442 acres, the average of the past three years. The gross assessed revenue during the year was Rs. 1,312 as compared with Rs. 2,101, the average of the past three years.

KHANDESH DIVISION.

TALWADA TANK.

The supply available in this tank is generally an uncertain factor. On 1st April, the contents of the tank were 77·33 million cubic feet and this figure gradually diminished to 52·09 million cubic feet. The first replenishment was received on 19th June, and this increased the contents of the tank to 55·33 million cubic feet. The maximum storage of 88·98 million cubic feet was reached on 15th February. The year closed with a storage of 1·15 million cubic feet of water in the tank.

The rainfall gauged at the tank was 10·23 inches as compared with 24·71 inches, the average of the preceding three years. The area irrigated was 203 acres and the gross assessed revenue amounted to Rs. 1,242. The revenue realized from water rates during the year was Rs. 568, the miscellaneous realizations being Rs. 207. The expenditure incurred on maintenance and repairs to the tank and canal was Rs. 400.

OLD WORKS.

The old bandharas and channels are grouped as under :—

(1) Upper Panjhra River group including Gondur Tank.
(2) The Kan river group.
(3) The Burai river group.
(4) The Girna river group.
(5) The Bori river group.

The sub-joined table shows the area irrigated and the revenue derived from these works as compared with the average of the preceding three years :—

Area irrigated.		Revenue.				Total.	
		Irrigation share.		Land share.			
1934-35.	Average.	1934-35.	Average.	1934-35.	Average.	1934-35.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
8,636	8,635	65,011	65,084	13,169	13,194	78,180	78,278

The expenditure incurred on these bandharas was as under :

	Rs.
Extensions and Improvements..	683
Repairs	79

An expenditure of Rs. 179 was also incurred on the river gauging operations carried out during the year.

SHOLAPUR DIVISION.

Borgaon Dam.

The total area irrigated during the year was 105 acres and the consolidated revenue assessed thereon was Rs. 563. The irrigation share of revenue amounted to Rs. 338 and the balance of Rs. 225 represented the land revenue assessed.

Sap Nalla.

The total area irrigated during the year under report was 201 acres and the consolidated revenue assessed on this area was Rs. 614. The irrigation share of the revenue amounted to Rs. 368 and the balance of Rs. 246 represented the land revenue assessed.

SOUTHERN CIRCLE.

BELGAUM DIVISION.

There are approximately 540 second class irrigation tanks situated in this Division. During the year under report, repairs to 23 tanks were carried out at a cost of Rs. 12,401 and in addition to this sum an expenditure of Rs. 990 was incurred on the survey of the old tanks. The area irrigated during the year amounted to 15,425 acres, the irrigation share of the land revenue being Rs. 1,22,576. The total direct and indirect receipts amounted to Rs. 1,16,740 as compared with a sum of Rs. 80,080 received during the previous year. The remissions sanctioned during the year amounted to Rs. 13,626.

DHARWAR DIVISION.

There are approximately 1,744 tanks in this Division. During the year under report, an expenditure of Rs. 33,108 was incurred on repairs to 87 tanks and a sum of Rs. 2,663 was spent on extensions and improvements. The area irrigated during the year was 49,877 acres and the irrigation share of the land revenue amounted to Rs. 1,69,263. The remission granted during the year amounted to Rs. 7,721. The total direct and indirect receipts were Rs. 1,70,145 as compared with Rs. 1,76,960 received during the previous year.

KANARA DIVISION.

In this Division there are approximately 2,128 tanks. During the year an expenditure of Rs. 15,426 was incurred on repairs to 38 tanks. A sum

of Rs. 2,455 was spent on " Surveying old tanks and preparing projects for their improvements " and on the work of constructing a motor garage attached to the irrigation store situated at Mundgod. The area irrigated during the year was 31,865 acres and the irrigation share of the land revenue amounted to Rs. 97,391.

RATNAGIRI DIVISION.

There are three tanks in this Division. Special repairs to the tank at Varad—viz., Reconstructing the regulator of the tank—were carried out during the year under review. The area irrigated amounted to 898 acres and the irrigation share of the land revenue was Rs. 6,583. The gross assessed revenue amounted to Rs. 6,583, the whole of which was realised during the year.

SECTION III.

IRRIGATION RESEARCH DIVISION.

In the Deccan, when a large perennial canal is opened, wide-spread water-logging is liable to ensue. Some of this water-logging dries out later, but the damage often extends rapidly into the valleys and, unless steps are taken to set matters right, the damage, consisting mainly of salt efflorescence, becomes permanent. The seriousness of the menace was realised as early as 1888 and the controversy regarding the relative effect of channel losses and wasteful irrigation and the best methods to adopt to safeguard the land became yearly more acute. Various experiments were carried out at the instance of the Agricultural Department but by 1913 it was clear that all the methods tried so far had failed. It was eventually decided to open a Special Irrigation Division in order that the question of canal development, especially as regards safeguarding the soil, might form the subject of investigation. In June 1916, the Division (now called the Irrigation Research Division) was formed and the work entrusted to it was the contouring of the commanded area, the carrying out of a careful survey and classification of the surface and sub-soil, the selection and marking out of definite areas suitable for "blocks" for perennial and other crops, the designing of the drainage works required, the indication of suitable lines of communication and centres for the establishment of crushing, grinding and refining and other machinery required for trade purposes and the study of the question of reclamation of waste lands and areas damaged by water-logging and salt efflorescence and the growth of useful timber in such tracts and along the main canal. In short, research and investigation into all the problems relating to irrigation by means of actual experiment has been the sphere of work of this Division.

The investigations coming within this sphere may be broadly grouped under five heads, viz. (1) Irrigation management, (2) Irrigation requirements or the inter-action of Agricultural requirements and Irrigation limitations, (3) Soil Physics of irrigated tracts, as affecting (4) Drainage and reclamation, and (5) Hydrodynamic Research. The results of these investigations are published in Technical Papers from time to time.

The work done by this Division during the year may be classified as under :—

(1) Sub-soil survey and observation of sub-soil water levels,
(2) Irrigation and Blocks,
(3) Sub-soil drainage construction,
(4) Drainage schemes for allotted sugar factory areas,
(5) Irricultural Research, and
(6) Hydrodynamic Research.

A brief account of the work done during the year under each of these heads is given below :—

(1) Sub-soil Survey and Observation of Sub-Soil Water Levels.

The observations of damage and sub-soil water levels were continued. The tendency on the older canals is for sub-soil water to recede and for damage to decrease mainly as a result of the restriction of cane according to the suitability of land. On the Nira Right Bank Canal, however, the sub-soil water is rising and the damage is increasing, as the canal system is new.

Detailed observations were taken in the areas served by the drainage schemes already constructed. These showed that, in general, the sub-soil water level in these areas was still receding.

(2) Irrigation and Blocks.

" X " classification of perennially irrigated lands under the Nira Right Bank Canal was under investigation. Individual inspections of lands as regards drainage and suitability of soil for fruit gardens for which applications were received were carried out during the year. The work of preparing plans showing the positional suitability of fruit gardens and sugarcane blocks for all canals is in progress.

(3) Sub-soil Drainage Construction.

The only drainage scheme under construction during the year was the Manjri Drainage Scheme in which all the remaining drains, which had been proposed, were completed and the area continued to dry out and improve as a result of the construction of the drainage scheme. The damaged area, previously 360 acres in extent, is now only 10 acres and the area in which the sub-soil water was within 4 feet of the surface, previously 604 acres, is now only 180 acres. The completion of the reclamation is being carried out in small patches by means of growing crops thereon.

(4) Drainage Schemes for Allotted Sugar Factory Areas.

Drainage scheme projects for the following sugar factory areas were under preparation :—

(1) Messrs. Marsland Price and Company Limited, at Kalamb, on the Nira Left Bank Canal.

(2) The Phaltan Sugar Works Limited, at Phaltan .. .. } On the Nira Right Bank Canal.

(3) The Saswad Mali Sugar Factory, at Akluj .. .. }

(4) The Belapur Company (extension area), at Harigaon .. .. } On the Pravara Left Bank Canal.

(5) The Maharashtra Sugar Mills Limited, at Belapur. .. .. }

In the Ravalgaon Sugar Farm area on the Girna Canal, the land has been classified according to soil suitability and, in addition, nalas have been surveyed with a view to the observation of the natural drainage and the preparation of a drainage project at a later date, if necessary.

Soil classification and shallow soil surveys were carried out for the Phaltan Sugar Works, Saswad Mali Sugar Factory and Messrs. Marsland Price and Company.

The Deolali Drainage Project was also under resurvey and revision.

(5) Irricultural Research.

In the Hadapsar Effluent Experimental Area, 56 acres of crops were grown of which 23 acres were sugarcane. The experiments carried out were mainly with a view to the indication of the varieties of sugarcane, which would give the best results under the limitations imposed and the most suitable treatment for cane manured by effluent.

In the Baramati Experimental Salt Area, 115 acres of crops were grown of which 31 acres were under sugarcane. The experiments carried out were mainly concerned with the improvement of soils damaged by alkalinity and the indication of the best varieties of cane and the most suitable treatment and methods of cultivation for cane grown in damaged tracts.

Simultaneously with the experiments conducted on fields in the two areas referred to above, laboratory experiments concerned with soils and sub-soils were conducted in the laboratories at Poona, Hadapsar Effluent Experimental Area and Baramati.

(6) Hydrodynamic Research.

During the year the Research Station at Khadakwasla was extended with a view to the accommodation of experiments required in the interests of the Nira Valley Development and model experiments on behalf of the Railway Board in connection with the Hardinge Bridge, Eastern Bengal Railway. The latter experiments are the first of their kind to be conducted in India.

(7) General.

Other experiments, such as experiments on " falls " for the Central Board of Irrigation and for the Irrigation Department of the United Provinces, further experiments on " falls ", experiments on silt exclusion from canals taking off from alluvial rivers, experiments on a model of the head regulator of the Nira Left Bank Canal with a view to increasing its discharge without additional loss of head and experiments on Gibb modules were carried out during the year. Simultaneously with the above experiments progress was made in the study of the fundamentals underlying the reproduction of Nature in Hydrodynamic models.

STATEMENT

Statement of Area irrigated by Irrigation Works in the Bombay

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	PRODUCTIVE.							
	Southern Circle.							
1	Gadikeri Tank	*418	..	*418	*418	..	..	..
2	Mavinkop Tank	*660	..	*660	*660	..	..	..
	Central Circle.							
3	Ekruk Tank	(779) 1,085	(1,155) 1,486	(1,934) 2,571	2,516	55	..	..
4	Shahada Channel	(683) 97 *600	(696) 291 *405	(1,379) 388 *1,005	1,393	..	..	..
	Total, Productive ..	1,182 *1,678	1,777 *405	2,959 *2,083	4,987	55	..	..
	UNPRODUCTIVE.							
	Northern Circle.							
5	Hathmati and Khari Cut Canals	†1,908 ‡14,549	3,665 360	5,573 14,909	5,527 14,445	46 464	..	..
6	Wangroli Tank	1,065	436	1,501	1,488	13	..	..
7	Savli Tank	2,103	10	2,113	2,111	2	..	..
8	Saiat Tank	250	405	655	652	3	..	..
9	Tranza-Nagramma Tanks	150	131	163	155	8	..	..
10	Futelao Tank	18	44	62	62	..	..	..
	Deccan Irrigation Circle.							
11	Nira Left Bank Canal ..	(23,573) 31,222	(35,482) 22,502	53,724	53,402	322	10,261	19
	Shetphal Tank	(2,283) 3,075	(2,389) 1,129	4,204	4,204	..	1,053	25
12	Nira Right Bank Canal ..	(19,007) 14,868	(17,905) 11,205	26,073	26,059	14	149	0·57
13	Mhaswad Tank	(1,589) 1,630	(453) 490	2,120	2,114	6	..	..
14	Mutha Canal	(7,094) 7,833	(4,835) 1,204	9,037	8,926	111	10	0·11
	Matoba Tank (c)	(691) 765	(1,200) 1,337	2,102 29(h)	2,102	..	..	..
15	Kasurdi Tank (c)	(2) 2	(35) 39	41	41	..	..	..
16	Shirsuphal Tank (c)	(506) 575	(519) 579	1,154	1,154	..	..	..
17	Bhadalwadi Tank (c)	(123) 149	(525 614	763	763	..	..	..

I-E.

Presidency, during the year 1934-35.

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.	..	
..	..	..	..	..	..	..	..	16th January to 15th October.	16th October to 15th January.
..	..	..	..	..	..	..	..		
10·09	17·07	10·04	17·07	101	95	101	95	15th February to 14th October.	15th October to 14th February.
6·45	7·30	6·45	7·30	114·73	139·73	114·73	139·73		
..	..	..	..	..	..	..	..		
§215	¶113	§68	¶91	8·28	32·43	26·18	40·27	15th June to 15th November.	16th November to 14th February.
133	22	133	22	103·5	16·36	103·51	16·36		
96·63	30·51	96·63	30·51	11·02	14·28	11·02	14·28	15th June to 15th November.	16th November to 14th February.
137·89	1·26	137·89	1·26	15·25	7·93	15·25	7·93		
26·11	19·91	26·11	19·91	9·57	20·34	9·57	20·34		
11·27	1·70	11·27	1·70	13·3	7·6	13·3	7·6		
Nil.	*Nil.*	*Nil.*	*Nil.*	*Nil.*	*Nil.*	*Nil.*	*Nil.*		
340	342	300	320	69	104	79	111	15th February to 14th October.	15th October to 14th February.
21	23	21	23	108	104	108	104		
279	267	279	267	(a)68	(a)67	(a)68	(a)67	Do.	Do.
62·75	75	62·5	75	(a)25	(a)6	(a)25	(a)6	Do.	Do.
151	111	(c) Not available.		(d)47	(d)44	(c) Not available.		Do.	Do.
4·37	10	4·37	10	157	120	157	120	Do.	Do.
..	..	..	..	..	..	..	..	Do.	Do.
3·6	3·7	3·6	3·7	141	140	141	140	Do.	Do.
4·13	7·14	4·13	7·14	30	74	30	74	Do.	Do.

STATEMENT

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*contd.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	UNPRODUCTIVE—*contd.*							
	Deccan Irrigation Circle—contd.							
	Lake Beale—Darna Dam	(469) 469	(152) 152	621	..	621	..	..
18	Godavari Right Bank Canal	(5,048) 6,935	(4,867) 1,418	8,353	8,313	40	587	7·02
	Godavari Left Bank Canal	(3 188) 6,372	(3,914) 1,325	7,697	7,300	397	714	9·27
19	Chankapur Tank—Girna Canal	(3 974) 4,956	(3,879) 2,860	7,816	7,801	15	36	0·46
20	Kadwa River Works — Palkhed Canal ..	(683) 1,259	(1,385) 909	2,168	2,163	5	12	0·55
	Kadwa River Works — Ojhar-Tambat Canal	(406) 715	(590) 301	1,016	1,016	..	5	0·49
	Kadwa River Works — Wadali Canal ..	(407) 592	(548) 318	910	909	1	1	0·10
21	Parsul Tank (e)	(199) 235	(131) 50	285	285	..	..	..
22	Pravara Right Bank Canal	(4,330) 4,744	(3,207) 775	5,519	5,519	..	264	4·78
	Pravara Left Bank Canal ..	(20,050) 16.457	(14.689) 4.618	21,075	20,777	298	709	3·36
23	Bhatodi Tank (e)	(68) c0	(496) 538	598	595	3	..	..
	Central Circle.							
24	Koregaon Tank	(38) 50	(377) 432	(415) 482	465	17	..	..
25	Ashti Tank	(377) 472	(1,179) 1,362	(1,556) 1,834	1,832	2	..	..
26	Pathri Tank	(13) 18	(412) 456	(425) 474	425	49	..	..
27	Jamda Canals	(739) 739	(1,209) 1,209	(1,948) 1,948	1,948	..	..	..
28	Hartala Tank	(19) 19	(22) 22	(41) 41	41	..	..	..
29	Mhaswa Tank	(12) 12	(18) 22	(30) 34	34	..	..	..
30	Lower Panjhra River Works	(1,470) 286 *1,189	(1,038) 981 *78	(2,508) 1,26 *1 267	2,534	..	420 30	17·94
31	Krishna Canal	(2,721) 3,156	(598) 690	(3,319) 3,846	3,359	487	41	1·05
32	Revari Canal	(90) 109	(291) 343	(381) 457	456	1	11	0·31
33	Upper Man River Works	(34) 43	(341) 417	(375) 460	457	3	18	0·5
34	Yerla River Irrigation Works	(221) 284	(1,235) 1,436	(1,456) 1,720	1,706	14	41	2·8

I-E—*contd.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
..	..	..	..	..	..	..	..	..	
183	163	183	163	(g) 27	(g) 29	(g) 27	(g) 29	15th February to 14th October.	15th October to 14th February.
142	150	142	150	(g) 22	(g) 26	(g) 22	(g) 26		
80	84	80	84	49	46	49	46	Do.	Do.
34	29	34	29	20	47	20	47	Do.	Do.
10	9	10	9	40	65	40	65	Do.	Do.
12	13	12	13	33	42	33	42	Do.	Do.
(e) 5	5	5	5	39	26	39	26	Do.	Do.
71·73	59·75	64·05	55·33	(b) 60	(b) 54	(b) 67	(b) 58	Do.	Do.
297·18	311·98	261·81	285·25	(b) 67	(b) 47	(b) 76	(b) 51	Do.	Do.
1·43	1·63	1·43	1·63	(f)46	(f) 304	(f) 46	(f) 304	Do.	Do.
0·27	3·30	0·27	3·30	140	125	140	125	Do.	Do.
2·45	5·31	2·45	5·31	162	233	162	233	Do.	Do.
0·21	2·54	0·21	2·54	61	167	61	167	Do.	Do.
29·33	51·74	29·33	51·74	27·79	34·71	27·79	34·71	Do.	Do.
0·02	0·18	0·02	0·18	950	222·22	950	222·22	Do.	Do.
0·58	0·74	0·58	0·74	20·69	24·32	20·69	24·32	Do.	Do.
1·99	0·84	1·99	0·84	766·33	1,759·52	766·33	1,759·52	Do.	Do.
52·55	64·47	52·55	64·47	76·71	66·53	76·71	66·53	Do.	Do.
2·82	8·06	2·82	8·06	32·62	49·26	32·62	49·26	Do.	Do.
0·25	2·02	0·25	2·02	148	178	148	178	Do.	Do.
3·23	8·24	3·23	8·24	85	173	85	173	Do.	Do.

STATEMENT

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*concld.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	UNPRODUCTIVE—*concld.*							
	Central Circle—contd.							
35	Chikhli Canal	(108) 146	(68) 93	(176) 239	233	6	..	..
36	Maini Tank	(64) 91	(788) 924	(852) 1,015	1,010	5	10	1·18
	Southern Circle.							
37	Gokak Canal, First Section and Storage Works.	4,670	2,231	6,901	6,668	233	943	13·66
38	Muchkundi Tank	12	..	12	12	..	..	..
39	Dambal Tank	19 *143	..	19 *143	19 *143	..	..	..
40	Medleri Tank	32	13	45	42	3	..	..
41	Madag Tank	355	285	640	640	..	..	..
42	Asundi Tank	55	132 *190	187 *190	181 *190	6	..	..
43	Dharma Canal	482 *5,227	..	482 *5,227	482 *5,227	..	..	..
	Total Unproductive ..	134,006 *6,559	68,349 *268	202,355 *6,827 29(*h*)	205,987	3,195	15,315	7·32
	Grand Total ..	135,188 *8,237	70,126 *673	205,314 *8,910 29(*h*)	210,974	3,250	15,315	7·15

Note.—The bold figures in brackets represent areas actually irrigated during the respective seasons and the duties have crops are irrigated. To obtain correct duties therefore these crops have to be added to the rabi areas.

(*a*) Low duties on the Nira Right Bank Canal and Mhaswad Tank are due to scattered nature of irrigation.

(*b*) The duties on the Pravara canals are low due to high proportion of perennial crops and also due to weed

(*c*) Figures of "utilized" discharge are not available, as the quantity let into the Matoba tank could not be accurately

(*d*) The low duties are due to high proportion of sugarcane and other perennial crops to the seasonal crops.

(*e*) There is generally no supply in the Kasurdi, Shirsuphal, Matoba, Bhadalwadi, Parsul and Bhatodi tanks in the hot an other causes. The actual number of days on which the channels were in flow has therefore been taken

(*f*) The high duties on the Bhatodi tank are due to concentrated irrigation on small channel. Major portion of the

(*g*) The low duties on the Godavari canal are due to weed trouble which causes heavy losses in transit.

(*h*) Area irrigated by under ground purcolotion.

* Area under consolidated assessment.

† Includes 128 acres for hot season.

‡ Includes 782 acres for hot season.

§ 147 (215—68=) cusecs were supplied to Khari Cut Canal through Bhujwa channel and Bokh feeder for irrigation.

¶ 22 (113 —91 =) cusecs were taken to replenish Bokh reservoir and for Rabi irrigation under Khari cut canal.

I-E—*concld.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
0·25	1·7	0·25	1·7	556	135	556	135	15th February to 14th October.	15th October to 14th February.
0·64	5·48	0·64	5·48	125	160	125	160	Do.	Do.
59·84	52·50	59·84	52·50	72·34	72·91	72·34	72·91	Do.	Do.
..	..	..	..	..	..	..	..	Do.	Do.
3·86	1·20	3·86	1·20	41·97	..	41·97	..	16th January to 15th October.	16th October to 15th January.
0·68	0·27	0·68	0·27	47·06	48·15	47·06	48·15	Do.	Do.
7·72	10·65	7·72	10·65	45·98	26·76	45·98	26·76	Do.	Do.
2·70	1·99	2·70	1·99	20·37	161·81	20·37	161·81	Do.	Do.
57·64	25·54	57·64	25·54	99·05	..	99·05	..	Do.	Do.
..	..	..	..	..	..	..	..		
..	..	..	..	..	..	..	..		

been calculated on these figures. In the rabi season in addition to pure rabi crops perennial and eight months.

trouble.

measured.

weather season. Even during the monsoon and rabi seasons the channels are closed for days together due to rainfall for purposes of calculating average discharge and duties.

irrigation is seasonal.

STATEMENT I-F.

Statement showing water-rates per acre in force during 1934-35 on Irrigation Works in the Bombay Presidency.

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Two Seasonal.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	PRODUCTIVE.											
	Southern Circle.											
1	Gadikeri Tank * ..	..	..	..	..	..	..	..	..			
2	Mavinkop Tank * ..	..	..	..	..	..	..	..	..			
	Central Circle.											
3	Ekruk Tank a ..	..	A 35 B 17½	8	3	5	7	..	2	*Nil.*	*Nil.*	*Nil.*
4	Shahada Channel a ..	..	A 23 B 14	8	3	5	6	..	2			
	UNPRODUCTIVE.											
	Northern Circle.											
5	Hathmati Canal a^1 ..	..	(b^4)	..	D 3 E 1	3	6	..	2			
	Khari Cut Canal a^1 ..	..	(b^4)	..	D 7 E 1	5	6	..	1 **2			
6	Wangroli Tank a^2 ..	..	(b^4)	6½	D 5 E 2½	4	6	..	1½			
7	Savli Tank a^4 ..	..	(b^4)	8	D 5 E 4	4	6	..	1½			
8	Saiat Tank a^5 ..	..	(b^4)	6½	D 4 E 2½	4	6	..	1½			
9	Tranza Nagrama Tanks, a^2	..	(b^4)	6	D 4 E 2	4	6	..	1			
10	Futelao Tank a^6 ..	..	(b^4)	..	D 4 E 2	a^7 3 a^8 2	5	..	a^9 1	*Nil.*	*Nil.*	*Nil.*
	Deccan Irrigation Circle.											
11	Nira Left Bank Canal. Shetphal Tank (*b*)..	§19 ¶16	M 45 C 66 B 22½ K 15	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½		(*e*)2			
12	Nira Right Bank Canal (*b*).	§19 ¶16	M 45 C 66 B 22½ K 15	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½		(*e*) 2			
13	Mhaswad Tank (*d*) ..	..	X	8	3	5	6	..	(*e*) 2			

STATEMENT I-F—*contd.*

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Two Seasonal.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept— *contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*contd.*											
	Deccan Irrigation Circle —contd.											
14	Mutha Canals and Matoba Tank (*c*)—											
	Sugarcane under the Mutha Canals within the Poona City and Suburban Municipal and Cantonment limits or within one mile of those limits.	..	50	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med 7½	Light 7 Med. 10½	..	(*e*) 2	*Nil.*	*Nil.*	*Nil.*
	On all remaining land commanded by both the canals.	..	M 45									
	Pan gardens ..	..	C 66									
	Perennial crops other than sugarcane and pan gardens.	..	B 22½									
	Pomegranates ..	..	15									
	Matoba Tank ..	..	(*g*)									
15	Kasurdi Tank (*d*) ..	..	X	8	3	5	6	..	(*e*) 2	*Nil.*	*Nil.*	*Nil.*
16	Shirsuphal Tank (*d*)..	..										
17	Bhadalvadi Tank (*d*)..	..										
18	Godavari Right Bank Canal (*b*).	§19 ¶16	M 45 C 66	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½	..	(*e*) 2			
	Godavari Left Bank Canal (*b*).		B 22½ K 15									
19	Chankapur Tank— Girna Canal (*d*).	..	X	8	3	5	6	..	(*e*) 2			

STATEMENT I-F—*contd.*

No.	Name of Work.	Water-rates.							Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
		Irrigation in blocks.	Perennial.	Two Seasonal.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.				
	Works for which Capital and Revenue Accounts are kept— *contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*contd.*											
	Deccan Irrigation Circle —concld.											
20	Kadwa River Works (*d*)—											
	Waghad Tank ..	..										
	Palkhed Canal ..	..										
	Ojhar-Tambat Canal	..	X	8	3	5	6	..	(*e*) 2	*Nil.*	*Nil.*	*Nil.*
	Wadali Canal ..	..										
21	Parsul Tank (*d*) ..	..										
22	Pravara Canals (*b*) ..	§19 ¶16	M 45 C 66 B 22½ K 15	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½	..	(*e*) 2			
23	Bhatodi Tank (*d*) ..	..	X	8	3	5	6	..	(*e*) 2			
	Central Circle.											
24	Koregaon Tank a[12] ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
25	Ashti Tank a[12] ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
26	Pathri Tank a[12] ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
27	Jamda Canals a[12] ..	..										
28	Hartala Tank a[12] ..	..	P 22*p* Q 28*q*	7*p* 8*q*	3	4*p* 5*q*	6	..	(*e*) 2			
29	Mhasva Tank a[12] ..	..										
30	Lower Panjhra River Works a[12]	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
31	Krishna Canal a[12] ..	..	A 32 B 16	8	3	5	8	..	(*e*) 2			
32	Revari Canal a[12] ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
33	Upper Man River Works a[12]	..	A 28 B 14	8	3	5	6	..	(*e*) 2	*Nil.*	*Nil.*	*Nil.*
34	Yerla River Irrigation Works a[12]	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
35	Chikhli Canal a[12] ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
36	Maini Tank a[112] ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			

STATEMENT I-F—*concld.*

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Two Seasonal.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept —*concld.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE —*concld.*											
	Southern Circle.											
37	Gokak Canal, 1st Section and Storage Works (*u*)	..	(b^1) 27½ (b^2) 20	8	3	5	15	..	2	*Nil.*	*Nil.*	*Nil.*
38	Muchkundi Tank (*s*)	..	(b^1) 10 (b^2) 5	..	2	2	5	..	1			
39	Dambal Tank (*w*)	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
40	Medleri Tank (*w*)	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
41	Madag Tank (*w*)	..	(*x*) 12	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
42	Asundi Tank (*w*)	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
43	Dharma Canal (a^{10})	..	..	..	4½	..	..	..	(*j*) 1 (*k*) 2			

NOTE.—(1) For lift irrigation in the Deccan Irrigation Circle the orders contained in G. R. No. 4771/27, dated 23rd December 1931, are that lift from Budkis should not be allowed at all in areas under the flow command of a canal and that in other areas it may be allowed only when the supply of water for irrigation is in excess of the demand at half the flow rates for all crops other than sugarcane for which full rate should be charged.

(2) For lift irrigation half the ordinary rates are charged in other circles.

(3) Double or treble the ordinary rates are charged as penal rates for taking water without permission.

(4) Leakage or percolation rates are the same as ordinary rates.

(5) Water-rates for non-irrigational purposes are charged at the rates sanctioned by Government in each case subject to the minimum rates fixed in G. R. No. 851, dated the 7th April 1924.

(6) In the D. I. C. monsoon or two seasonal crops which take pre-seasonal waterings between the 25th April and the break of the monsoon are charged the following water rates per acre according to the date of first watering applied for and sanctioned, *vide* G. R. No. 5602/27, dated 9th December 1931 :—

From the date	Rate for light type of crops. Rs.	Rate for medium type of crops. Rs.
25th April	5	7½
5th May	4	6
15th May	3	4½

(7) A reserve rate of Rs. 3 per acre as a minimum rate has been sanctioned for lands let out for cultivation in the basin of Lake Beale—*vide* G. R. No. 2484, dated 12th June 1925.

(8) A flat rate of Rs. 2-8-0 per acre of culturable area has been sanctioned up to 14th February 1934 for the supply of water from the irrigation channel of Sangur village to the irrigators who have not suffered in any way from land acquisition for the Lloyd Dam—*vide* G. R. No. 1849/27, dated 5th January 1932.

* Lands wholly assessed at consolidated rates.

§ Block rate for blocks in 1: 3 proportion of sugarcane.

¶ Block rate for blocks in 1: 4 proportion of sugarcane.

** For single waterings crops for which no application for irrigation throughout the season was previously submitted.

A—For sugarcane and pan gardens.

B—For perennial crops other than sugarcane.

C—For pan gardens for the whole year. If water is given for part of the year the charge will be on the basis of thrice the medium seasonal rates for the seasons concerned—*vide* G. R. No. 5602/27, dated 9th December 1931.

D—For rice.

E—For monsoon crops other than rice.

P—For perennial crops other than sugarcane—Rs. 12.

Q—For perennial crops other than sugarcane—Rs. 14.

X—For pomegranates.
M—For Sugarcane.

X—For sugarcane and pan gardens double the seasonal rates and for other perenniol crops single seasonal rates shall be charged.

(*b*) The rate for sugarcane and block rates sanctioned in G. R. No. 5602/27, dated 28th November 1932. The rates for crops other than sugarcane are to be in force from 15th February 1931 to 14th February 1934—*vide* G. R. No. 5602/27, dated 9th December 1931. The same rates have been continued up to 14th February 1936—*vide* G. R. No. 5602/27, dated 23rd September 1933.

(*c*) Rates for sugarcane within the Poona City and Suburban Municipal and cantonment limits or within one mile of those limits and for sugarcane in other areas to be in force up to 14th February 1936—*vide* G. Rs. Nos. 5602/27, dated 9th December 1931, dated 28th November 1932 and 23rd September 1933. The rates for crops other than sugarcane to be in force up to 14th February 1936—*vide* G. Rs. Nos. 5602/27, dated 9th December 1931, 28th November 1932 and 23rd September 1933.

(*d*) Rates sanctioned in G. R. No. 5602/27 dated 9th December 1931, as amended by corrigendum No. 5602/27, dated 15th February 1933, to be in force with effect from 15th February 1931 to 14th February 1934. The same rates have been continued up to 14th February 1936—*vide* G. R. No. 5602/27, dated 23rd September 1933.

(*e*) The single-watering rate applies to one pre-seasonal or post-seasonal watering to a sanctioned crop. If more than one such watering is taken, the full seasonal rate will be charged unless specifically ordered otherwise. The single watering rate is not applicable to seasonal irrigation.

(*g*) For sugarcane the short-term cane rates as per scale sanctioned in G. R. No. 8670, dated 13th January 1927 (which may be in force on major irrigation works), for pan gardens the same rate as on the Mutha Canals and for other perennials single medium seasonal rates will be charged—*vide* G. R. No. 5602/27, dated 9th December 1931.

(*j*) From 15th June to 15th October.

(*k*) From 16th October to 14th June.

(*l*) From 15th February to 15th June.

(*m*) From 15th June to 15th October or 15th July to 30th November.

(*n*) From 15th October to 15th February.

(*o*) To be in force from 15th February 1934 to 14th February 1935.

(*q*) To be in force from 15th February 1935 to 14th February 1936.

(*s*) In force up to 15th February 1937—*vide* G. R. No. 5459/27, dated 13th May 1931.

(*u*) In force up to 14th December 1936—*vide* G. R. No. 466/27, dated 22nd January 1934.

(*w*) Rates sanctioned for the period of five years ending 31st March 1935—*vide* G. R. No. 6095, dated 22nd October 1924 and G. R. No. 3187/27, dated 22nd August 1929.

(*x*) For sugarcane, betel leaves, etc., for 12 months.

(*y*) For eight months from 15th June to 15th February.

(*z*) For eight months from 15th October to 15th June or 1st August to 31st March.

a Rates to be in force up to 14th February 1936—*vide* G. R. No. 5602/27, dated 15th February 1933.

a^1 Rates sanctioned in G. R. No. 4855, dated 23rd December 1927, are to be in force up to 14th February 1937—*vide* G. R. No. 5956/27, dated 22nd October 1931.

a^2 Rates sanctioned in G. Rs. Nos. 825, dated 30th August 1924, and 825, dated 1st November 1926, and continued in G. R. No. 2861/27, dated 4th July 1929, are further continued up to 14th February 1940—*vide* G. R. No. 2881/27 dated 9th July 1934.

a^3 Rates to be in force up to 31st July 1938—*vide* G. R. No. 679/27, dated 11th October 1932.

a^4 Rates to be in force up to 15th June 1940—*vide* G. R. No. 2894/27, dated 1st June 1934.

a^5 Rates sanctioned in G. Rs. Nos. A-I-309, dated 15th February 1911, 5412, dated 15th December 1926, 2835/27, dated 4th October 1929, are to be in force up to 15th June 1940—*vide* G. R. No. 2835/27, dated 2nd July 1934.

a^6 Rates to be in force up to 14th February 1940—*vide* G. R. No. 2691/27, dated 9th July 1934.

a^7 For ordinary rabi.

a^8 For restorative crops grown after rice.

a^9 In either kharif or rabi season.

a^{10} Rates sanctioned in G. R. No. 293/27 of 9th August 1927 are to be in force up to 31st March 1937—*vide* G. R. No. 293/27, dated 14th February 1931.

a^{12} Rates sanctioned in G. R. No. 5602/27, dated 15th February 1933.

(b^1) Rate for perennial 12 months.

(b^2) Rate for perennial 8 months.

(b^4) Single seasonal rates are charged—*vide* G. R. No. 3343/27, dated 8th October 1929.

(b^6) For sugarcane the single-watering rate is Rs. 2—*vide* G. M. No. 6275/27-I.B., dated 23rd February 1932.

Administration Report of Irrigation Works in the Bombay Presidency for 1934-35 : Review of— .

GOVERNMENT OF BOMBAY.

PUBLIC WORKS DEPARTMENT.

Resolution No. P. 22.

Bombay Castle, 26th August 1936.

RESOLUTION OF GOVERNMENT.

The irrigation works dealt with in this Report, which covers the period 1st April 1934 to 31st March 1935, fall into two categories, viz. (*i*) tanks and canals for which Capital and Revenue Accounts are kept, and (*ii*) small tanks, bandharas and drainage channels, for which neither Capital nor Revenue Accounts are kept. The works included under (*i*) are described in detail in Section I of the Report. The works mentioned under (*ii*) are small and numerous and a brief account of them is given in Section II of the Report.

2. The total capital outlay on works for which Capital and Revenue Accounts are kept, to the end of the year under review, amounted to Rs. 10,67,98,522.

Including an area 8,910 acres, on which a consolidated water and land assessment is levied, the total area irrigated was 214,253 acres, as compared with 213,047 acres in the previous year.

The gross assessed revenue amounted to Rs. 25,66,862 as compared with Rs. 24,04,530, during the previous year and Rs. 24,23,200, the average of the past three years.

The unrealised balance of revenue demands at the close of the year amounted to Rs. 17,12,341. A portion of this amount has since been recovered and steps have been taken to effect the early recovery of the balance outstanding.

The working expenses amounted to Rs. 15,45,418 as compared with Rs. 15,14,400 in the previous year.

The net revenue (after deducting working expenses) amounted to—

	Rs.
(*i*) On the basis of assessment	10,21,444
(*ii*) On the basis of realisations	14,50,667

as compared with Rs. 8,90,130 and Rs. 10,31,179, respectively, during the previous year.

The statement embodied in paragraph 13 of the Report shows the financial results of the more important works for which Capital and Revenue Accounts are kept.

3. The total area irrigated by works for which neither Capital nor Revenue Accounts are kept was 171,394 acres, and the gross revenue realised was Rs. 8,20,264. The total expenditure incurred on improvements and repairs to these works amounted to Rs. 4,24,639.

By order of the Governor in Council,

J. R. PHILLIPS,
Deputy Secretary to Government.

To

The Finance Department.
The Revenue Department.
The Commissioner, Northern Division.
The Commissioner, Central Division.
The Commissioner, Southern Division.
The Director of Land Records.
The Director of Agriculture.
The Commissioner of Labour and Director of Information.
All Superintending Engineers of Circles.
All Collectors (except those of Bombay, Thana, Kolaba and Bombay Suburban District).
The Accountant General, Bombay.
All Executive Engineers in charge of Irrigation Works.
The Secretary to the High Commissioner for India (by letter).

BOMBAY : PRINTED AT THE GOVERNMENT CENTRAL PRESS.

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MAP OF THE BOMBAY DECCAN & GUJARAT

TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT FOR 1934-35

SCALE 40 MILES TO 1 INCH

REFERENCE.

NORTHERN CIRCLE

Ahmedabad Division.
Kaira and Panch Mahals Division
Surat and Broach Division.

CENTRAL CIRCLE

Poona Division
Sholapur Division
Khandesh Division.

DECCAN IRRIGATION CIRCLE

Nasik Irrigation Division
Ahmednagar Division.
Poona Irrigation Division
Nira Right Bank Canal Division.

SOUTHERN CIRCLE

Belgaum Division
Dharwar Division
Kanara Division
Kolhapur Division

NORTHERN CIRCLE

AHMEDABAD DIVISION

AHMEDABAD DISTRICT

Works in Operation.

1. Godhooli Canal
2. Bodri Reservoir
3. Pavoi (Sabarmati Diversion
4. Vishnupura Diversion
5. Vishnupura Diversion
6. Ghoda Tanks
7. Ojat Dam
8. Godhooli (Sarej) Dam
9. Chekla Dam
10. Khari Cut
11. Chandlai Tank
12. Vasai Reservoir
13. Tundav Tank
14. Vasna Barrage
15. Sabarmati & Western Diversion at Dholka
16. Odhav Bridge Dam
17. Maharpur Dam

KAIRA DISTRICT.

Works in Operation.

18. Khan Station
19. Gokhlaj Tank
20. Gelal Tank
21. Dhaud Reservoir
22. Nasa Reservoir

KAIRA & PANCH MAHALS DIVISION

(1) KAIRA DISTRICT

Works in Operation.

1. Mater Tank
2. Dasda Tank
3. Nagarsa Tank
4. Kanjari Tank Bhoor.
5. Kanjarad Tank
6. Jasar Tank
7. Lasd Tank
8. Wangroli Tank
9. Phadtar Tank
10. Mandwa Tank
11. Tarapur Canal Distr.

Incomplete Work.

12. Pavoi Tank

(2) PANCH MAHALS DISTRICT.

13. Mandelav Tank
14. Kanadwav Tank
15. Mandla Tank
16. Gadadi Tank
17. Mater Tank
18. Fatehpur Tank
19. Sangoora Tank
20. Kadana Tank
21. Umeedwari Kadali Tank
22. Patia Tank
23. Wavad Supply Tank
24. Kanthav Tank
25. Dahod Tank
26. Gamdi Tank
27. Ratlam Wadgadi Tank
28. Wada Talav Tank
29. Sada River Project

SURAT & BROACH DIVISION.

(1) BROACH DISTRICT

Works in Operation.

1. Kasv-Mahiglam Junction Diversion Channel
2. Vishwamitra Katkaya Diversion Channel.
3. Vishwamitra Dadhar Diversion Channel
4. Amraport-Dadhar Diversion Channel
5. Godhar Branch Canal
6. Wagra Canal
7. Chanod Irom Uber Village Canal Channel under Dadhar
8. Kanwar Irula Diversion Canal
9. Chanod Diversion Head Regulator
10. Godhar Distrib and Sidewalks
11. Vrandavan Canal
12. Vrandavan Dadhar Channel
13. Pathankot-Kanhad Channel
14. Sadhli-Kalod Channel
15. Jolva Channel
16. Ghor-Valand Bridge-Channel
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CENTRAL CIRCLE

POONA DIVISION

Works in Operation.

1. Kashtee Canal
2. Kukvee Canal

SHOLAPUR DIVISION

Works in Operation.

1. Ghod Tank
2. Adsi do.
3. Pathri do.
4. Wadhwar Tank
5. Kavagaon do.
6. Chikhi Canal.
7. Mayni Tank
8. Upper Kasa Works
9. Wagi Tank
10. Yeda River Diversion
11. Shirdhon Tank
12. Hirge Tank
13. Gavagaon Tank
14. Wangi Tank

KHANDESH DIVISION

Works in Operation.

1. Hatti Tank
2. Tonse Tank
3. Upper Kan Minor 3 channels
4. Upper Panjhra River Group
5. Upper Gomai River Group
6. Girna River Group
7. Kon-Kasar Group
8. Jamda R. B. Canal
9. do. do.
10. Mhasvee Tank
11. Pimpalner Tank

DECCAN IRRIGATION CIRCLE

NASIK IRRIGATION DIVISION

Works in Operation.

1. Waghad Tank
2. Chandorpur Tank
3. Chinchadevi Tank
4. Girna Canal
5. Palkhed do.
6. Walzee do.
7. Nasik Pipeline Canal
8. Pimpal Tank
9. Girna Group
10. Asarv Group
11. Mosam Group
12. Godavari do.
13. Kashee do.
14. Darna do.
15. Do. do.
16. Mahasvag Group
17. Darna Reservoir (Lake Basin)
18. Godavari R. B. Canal
19. do. L. B. do.

Work under Construction—Incomplete Work.

20. Odhi Tank

AHMEDNAGAR DIVISION

Works in Operation.

1. Wilson Dam (Lake & Mill)
2. Pravara R. B. Canal
3. do. L. B. do.
4. Left Canal do.
5. Mutha Canal
6. Ahmednagar Canal
7. Bhandardara Canal
8. Nilwande Canal

Work under Construction and in Operation.

9. Godhar Tank

POONA IRRIGATION DIVISION

Works in Operation.

1. Lake Fife
2. Mutha R. B. Canal
3. Mutha L. B. do.
4. Mula R. B. Canal
5. Mula Canal
6. Khadakwasla Tank
7. Khadakwasla Canal
8. Nira Canal
9. Kirkee Canal
10. Yerandwana Tank
11. Yerandwana Canal
12. Lower Dam & Bunder (for Lake Waters)
13. Nira R. B. Canal (Nira to Jejuri)

Work under Construction and in Operation.

14. Nira R. B. Canal (Jejuri to Nira)

Work in Operation.

15. Mhaswad Tank

Incomplete Work.

16. Shambodi Tank

NIRA RIGHT BANK CANAL DIVISION

Work under Construction and in Operation.

1. Nira R. B. Canal (Nira side to 21 miles)

Work in Operation.

2. Mhaswad Tank

Incomplete Work.

3. Shambodi Tank

SOUTHERN CIRCLE

BELGAUM DIVISION

Works in Operation.

1. Ghataprabha Anicut and Storage Works
2. Gokak Canal

Canal Tank

DHARWAR DIVISION

Works in Operation.

1. Dandeli Tank
2. Kodlur do.
3. Malag do.
4. Anasi Tank
5. Dharwar and Hangal Canals
6. Shiggaon Tank

KANARA DIVISION

Work in Operation.

1. Mavinkop Tank